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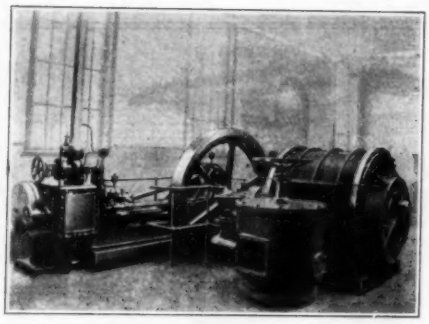

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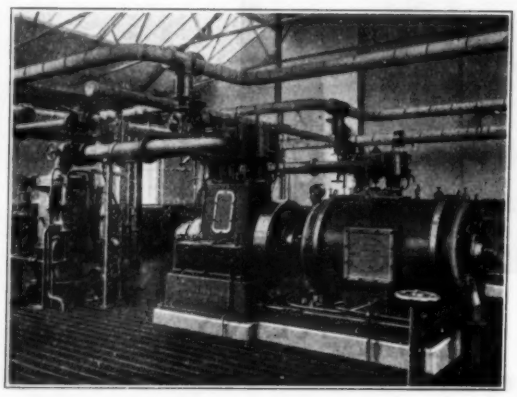

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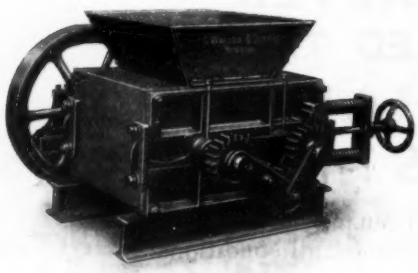

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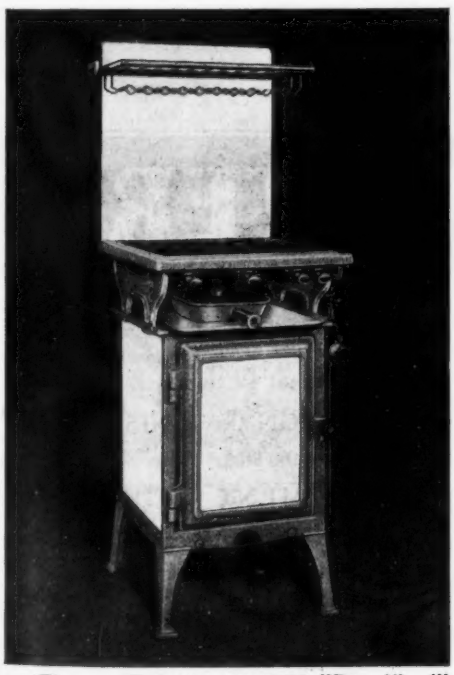

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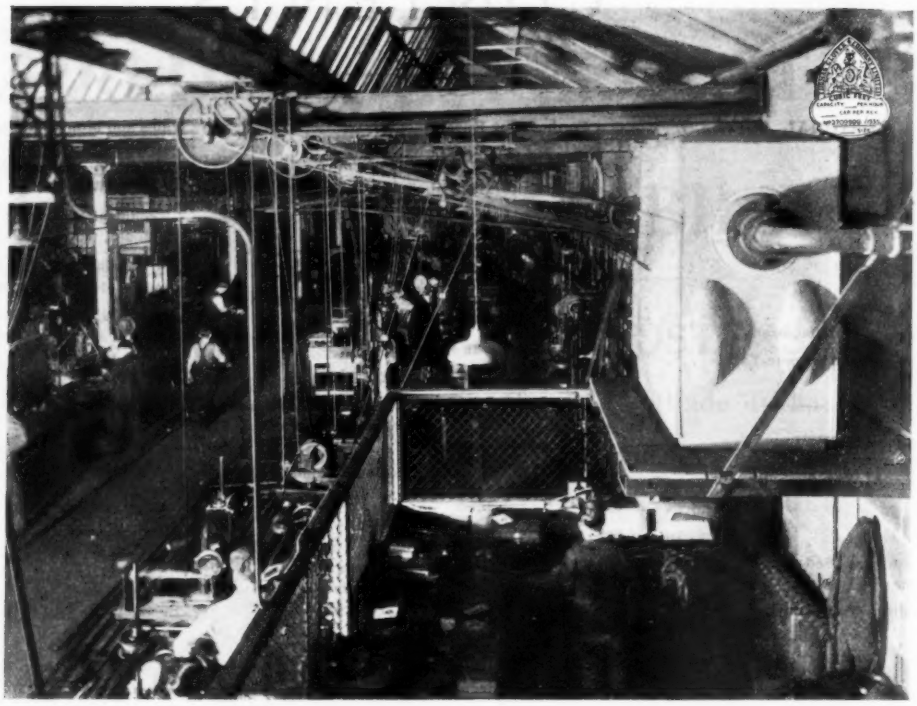

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Gas Journal

MARCH 13, 1935

Vol. 209. 87th Year No. 3747.

Editorial Notes

Good—

THERE are many satisfactory features about the records of the past year's work of the gas companies throughout the country. From the numerous reports, reference to which has been made in the "JOURNAL," readers will have noted with gratification the large number of undertakings which show an increase in gas sales, many of the figures being records in the history of the undertakings concerned. Increases over 5% are by no means uncommon, and the Sheffield Company has forged ahead to the tune of over 12% increase. As for the Metropolitan and Suburban Companies, out of the nine dealt with by Mr. F. J. Bradfield in his compilation published in the "JOURNAL" last week only three had a falling away in sales. And in contemplating the progress of the Industry in 1934 it has to be borne in mind that the abnormally mild weather towards the close of the year was not exactly calculated to make gas executives happy. It was sad to see so many promising increases at the end of November marred by the thermometer during the following four weeks.

Generally, there must be the liveliest satisfaction with the coke sales results—greater quantity and higher revenue, the result of more belief in the merits of the solid smokeless fuel made in gas-works practice and greater determination to market a product which will better meet the exacting requirements of the consumer of to-day. To some of the results we have already referred: The record sales by the Gas Light and Coke Company, with an additional £180,000 in the kitty; the South Metropolitan and the Commercial with substantially increased revenue from this source; the Tottenham Company, which fixed more than 3,500 coke burning grates during the twelve months. Then Hornsey has the cheerful story of an additional £4,000 from coke, and Wandsworth records largely increased revenue, due materially to the operation of the new coke handling plant. So we could go on; but these few particulars appear to substantiate our oft-expressed view that good coke is well worth making.

There are three other exceedingly satisfactory features of the year's working. One is the enormous number of appliances installed. "All previous records broken" is the order of the day—more new cookers, more new fires, more new water heaters. The Gas Light actually issued 280,000 cookers during the year, while Weymouth states with simplicity: "The sales of appliances during the year again show the very gratifying increase of 55%." This merely to exemplify. The second feature is the growing application of gas to industrial and commercial processes, which in part must be attributed to the excellent work of the Industrial Development Centres. The industrialist is, to his pleasure and profit, coming to the conclusion that gas is the ideal fuel. The third gratifying feature is the great increase in the number of consumers—hundreds of thousands of recruits to widen the base of the Gas Industry.

And Bad

AND now we come to the fly in the ointment, and we must face up to the fact that it is no small fly. The decrease in consumption per consumer is disquieting, and the figures would be still more depressing if the sales per domestic consumer were set out quite distinctly from the sales per industrial consumer. This question is of such vital importance that we think that in presenting the results of future years' work this segregation should be made. No possible good can come of presenting misleading statistics, and the "consumption per consumer" figures given by undertakings to-day are liable to be misleading. The picture is painted in all too bright colours, and we have yet to learn that living in a fool's paradise is at all helpful to the future of gas. There are, of course, reasons for this decline, apart from the mildness of the weather in 1934. The habits of the people have changed, and the tin opener is no friend of the Gas Industry. Again, the efficiencies of modern gas appliances show great improvement on those of apparatus installed only a few years ago. The consumer uses less gas for equal service, which is all to the good in acting as a bulwark against competition but is not temporarily beneficial to the revenue accounts of gas undertakings. Then the cost of supplying the new consumers, entailing longer mains and services, a dip into capital to provide

for easy purchase terms, and so on, is much more than formerly. A perspective of what is happening is to be gained from the following quotation from Dr. Carpenter's Address to the shareholders of the South Suburban Gas Company: "The increase in the number of consumers was 6½% all told—10,836, as compared with 12,856 in the previous year. Also—and this is a very important point—the quantity of gas consumed per consumer has fallen by 5¼% as compared with the previous year, which itself was lower than in the previous year by 4¾%. I think this reduction is capable of a simple explanation, but the fact remains unalterable, and it does adversely affect the overhead charges we have to meet; they do not become less, but the consumption to which they are related is reduced."

The Remedy

THE question boils down to this: We have added greatly to the number of consumers; at the same time we have put on the district more appliances than ever before. How are we going to make the consumers use these appliances fully? In *The Times* of March 2 there was an article on electricity in the home. It occupied a column on the leader page, but the whole of the article could be summed up by saying that if the public want cheaper electricity they must use more of it. The same rather obvious reasoning applies to the Gas Industry. If the public want cheaper gas, they must use more of it. And it seems to us that the Industry has a remedy to the decline of the consumption per consumer, and it is for the Industry to break the chain of a vicious circle. Unless the consumer is encouraged practically to use more gas he will not do so, and the Industry will have to take the plunge, risk or no risk, in offering the consumer inducement to burn gas. Certain it is that the consumer will not take the first step. We think that the course of action likely to lead to success is for gas undertakings, in a spirit of confidence, to adopt more attractive tariffs. "New rates must be formulated in the knowledge that gas can provide superior service." We quote from our comments in these columns on Jan. 23 of this year. At the same time we must make the public more gas-minded; and here again the Gas Industry must take the first step by setting its own house in order. In the "JOURNAL" for Feb. 20 we queried whether our Industry is gas-conscious throughout, whether every single member of the personnel of the Industry is pulling his weight as an active propagandist for gas. From the highest to the humblest, everyone dependent for his livelihood on the Industry has a duty to perform in influencing those in his immediate circle. His prosperity is entirely bound up with that of the undertaking and the Industry he serves; and in this respect a "gas man" has a great advantage over the one of his friends is a potential daily customer.

To revert to attractive tariffs, it is apparent from the results of undertakings already published in the "JOURNAL" that we have reached a stage when we can gain large numbers of new consumers and install vast quantities of apparatus, but that we are failing to make the consumers use these appliances to the full. We are increasing capital incidence, which is not the royal road to lower gas prices. It is chiefly, we suggest, through attractive tariffs that we shall lower overheads and increase consumption per consumer. And in this connection we call attention to the valuable paper on charging for gas by Mr. Scarth, of the Gas Light and Coke Company, which was published in our issue of Feb. 27 and which evoked such an excellent discussion. We think that the Author puts forward a very pretty case, and that the arguments against fail in their purpose. Having discussed multi-part tariff structure, Mr. Scarth concludes that the introduction of such a form of charge must involve a business risk which should bring its reward in expanding sales, *which would more than compensate for the immediate loss of existing revenue.*

Bold Policy Needed

FOR our part we think that force of competition will oust the flat-rate complex of many gas undertakings. A low commodity charge is of great appeal to the consuming public, and the service charge—a known quantity which is budgeted for—is quickly forgotten. Obviously the most appropriate time to make a change in any charging method is when a price reduction is due to be made, and any surplus profits to be disposed of would be more usefully employed as a means of attracting new business than by a general reduction in the flat-rate price. Apart from this, however, and it is succinctly pointed out by Mr. Scarth—an undertaking may have no surplus to effect a price reduction and yet, because of competition, has to offer reduced prices to maintain existing business. Here again the plan should be to adopt a method of charge alternative to the flat rate. To quote Mr. Scarth: "By a bold policy additional sales could be obtained, bringing in, although reduced, some element of profit which in the aggregate would restore the revenue of the undertaking to the standard level."

We have called attention to the large increase in revenue from coke sales enjoyed by gas undertakings in 1934. We become more and more convinced that the future prosperity of the Gas Industry will depend on whether those responsible for its progress look upon it as a Products Industry. It is quite reasonable to expect that—and we assume that, in the light of experience during the past year, still greater attention will be paid to manufacturing and marketing good solid smokeless fuel—the revenue from coke will show a satisfactory advance this year. Cannot that anticipated increase in revenue be regarded as some inducement to undertakings to take a business risk in adopting more attractive tariffs for gas?

Cart First?

THE extra load we need will not be gained, as we have said, if the Gas Industry expects customer demand to *precede* the offer of attractive tariffs and first-class service facilities. In these days of competition the idea of waiting for custom is absurd, and two recently reported statements indicate a line of thought which our Industry should eschew. On the point of service, the reply made on behalf of a railway company to a request for an improved train schedule for a certain town was to the effect that this could not be granted until the population grew larger. As a councillor remarked, that seemed to be "putting the cart before the horse." Would it not be a fair assumption that, with a better train service, the population would grow, while at the same time the existing population would have less reason to become "road transport minded?" On the subject of price, in reply to a question as to whether the country might expect a return to penny postage, a calculation was presented of the amount that would be sacrificed thereby, but we do not gather to what extent (if at all) this calculation took into account the additional number of letters that might be expected to be despatched at the lower rate of postage. The Gas Industry must "put the horse before the cart."

A B.G.F. Committee

A FORTNIGHT ago we expressed the hope that something might shortly be heard from the British Gas Federation on a subject of national interest which had been referred to it at the end of last year—the question of Gas Industry participation in exhibitions. We are pleased, therefore, to be able to announce in our news columns to-day the names of members of an Exhibitions Committee which the Council of the Federation has appointed after a discussion of the whole question. This evidence that activity is afoot will be generally welcomed, especially by those who had misgivings when it was originally decided not to participate in this year's Castle Bromwich B.I.F. Though this particular matter is, of course, no longer in question, we mention it merely as an example of the kind of problem in which the Committee may in future be so usefully able to reconcile, or adjudicate upon, two distinct and opposed views.

The Committee, we learn, has received wide terms of reference; the list shows that on it are represented all sides of the Gas Industry, and it is intended to deal with the presentation of the gas case in all national exhibitions. The formation of a Committee of this kind, which we understand is to be a permanent one, should be of the greatest use in co-ordinating the Industry's activities in an important phase of publicity, and we feel sure that the Convenership could not be in better hands than those of the Manager of the B.C.G.A., Mr. W. D. Rowe. Without interfering in any way with questions of purely local exhibitions, which in general must remain a matter for the local gas undertaking, there will be ample scope for activity in directing available resources into the most effective channels in such cases as the B.I.F. and the Ideal Home Exhibition, and even the consideration of the advisability of holding a purely gas exhibition such as has been freely advocated in some quarters. We feel sure that, having "held a preliminary meeting at which a discussion of general procedure took place," the Committee will quickly get down to serious business, and will be quite ready to scrutinize very exactly the work of our own Industry and its competitors at the Ideal Home Exhibition this month, and the effectiveness of our competitors at Castle Bromwich in May.

It is good to be able to welcome this first outward and visible sign of activity on the part of the Federation which obviously has such potentiality for advancing the interests of our Industry. We do not believe that it is by any means the only direction in which the Federation is exploring possibilities, but we are content for the moment to grant that the Council is the best judge of what it shall tell the world, and what it shall not. On the other hand, we take the view, which we have expressed before in the same connection, that a little publicity is good at times for even the highest authorities. For the Federation to be of maximum benefit to the Industry, it must have the confidence of those for whom it would speak, and we trust that too austere a view will not be taken of what may, and what may not, be revealed of their work.

Contractors and Manufacturers

THE value of representation on the Exhibitions Committee will be appreciated by none so much as the Industry's contractors and manufacturers, who will be able to voice their views in common council, as perhaps never before, on a subject so vitally affecting them. Which reminds us that it was an exhibition which led to the founding of their Society of British Gas Industries 30 years ago. It is interesting to refer back to the "JOURNAL" article on Dec. 6, 1904, in which the case was put for the formation of an organization which could speak with authority for their side of the Industry. Let us quote a few lines: "In the first place, at the present time, the contractors and manufacturers are not—and cannot be because of the want of an organization of standing which can be approached—taken so fully into the counsels of the Gas Industry as they might otherwise be." We think few of them will deny that, if there was need in those days for an organization with the authority and prestige to speak for them, the need is even greater to-day. For one reason alone, the present trend of development in the Gas Industry is one which is undoubtedly causing uneasiness among them—whether with good cause or not we need not now discuss. Quite manifestly they cannot express their views individually on the question of "rationalization" and the directions in which it is now proceeding. As a body they can quite well do so, and in so far as their views are clearly free from bias, they will receive attention in the Industry in proportion to the authority and prestige of the collective body which puts them forward.

This is merely one example of the need in these days for a strong association of contractors and manufacturers, which in our opinion is vitally necessary for contributing to the common counsel the views of a most important section of the Industry. In advancing this claim on their behalf we propose to quote again from our 1904 article, in which we described them in terms which more than ever hold to-day, as "a section of the country's manufacturers and contractors, without whom what is generally known as the Gas Industry cannot exist, and who, on the other hand, have their very being in the existence of the Gas Industry. These are the specialists in gas manufacturing and distributing plant and in the appliances through and by which the gas made is utilized, and through and by which gas has been rendered what may be truly termed a necessity to the community. The work of those specialists in plant and appliance production has, we venture to think, had as much to do with the progress of the Gas Industry as the work of those who are specialists purely in the production of gas and in the administration of the business of gas supply. In other words, by their work, by their economical and serviceable productions, they have assisted in creating the demand for gas which has built up the Gas Industry."

We do not believe there is any disposition on the part of the Industry as a whole to deny its debt, both in the past and to-day, to its plant and appliance manufacturers for the way in which they have played their very essential rôle in the raising of the Industry to its present national position. The constitution of the British Gas Federation is recognition of their standing; it is up to them to pull their full weight and speak with the authority which their years of service have given them.

Treasury Grants and Income-Tax

DURING the past few years many gas undertakers have loyally responded to the request made by the Government in 1929 to accelerate work for the purpose of creating employment. In so doing they have availed themselves of the provisions of the Development (Loans, Guarantees, and Grants) Act, 1929, to obtain financial assistance from the Treasury based in every case upon a careful consideration of the cost of the work proposed.

It is improbable that many undertakers in so doing considered the effect such grant might have upon their liability to income-tax. The Inland Revenue has, however, put forward two contentions which if accepted by

the Courts would penalize those undertakers which have been most anxious to play their part in relieving unemployment in their areas. The first contention of the Inland Revenue is that such grants must be regarded as Revenue receipts and are therefore liable to income-tax. It has already been decided by the House of Lords that grants made before 1929 are not taxable, but the Inland Revenue seeks to show that this decision is not applicable to grants made under the particular provisions of the Development Act, 1929. This question can, of course, only be determined by the Courts, and two test cases (one relating to a Water Company and the other to a Gas Company) are at present awaiting hearing by the Special Commissioners of Income-Tax.

The other point which the Inland Revenue has raised was on Friday last decided by the House of Lords in favour of the taxpayer. The question in this case related to the method of computing annual wear and tear allowances under Rule 6 of Cases I. and II. of Schedule D of the Income-Tax Act, 1918, upon plant and machinery provided with the assistance of grants from the Treasury. The Rule provides that wear and tear allowance shall be based upon "the actual cost to the person by whom the trade is carried on." What is "the actual cost to the person by whom the trade is carried on" of plant and machinery in respect of which a grant from the Treasury has been made? The contention of the Crown was, in brief, that actual cost meant the cost which had come out of the pocket of the taxpayer, and therefore could not include sums which had originated from external sources.

Thus, in the case under consideration (Birmingham Corporation *v.* Barnes), where the Corporation had received from the Treasury a grant of £46,238 on a tramway track costing in all £271,399, the Revenue argued that the actual cost to the Corporation was £271,399, less £46,238, or £225,161. Wear and tear allowances were, therefore, in the contention of the Crown to be based on £225,161, and not upon the larger sum of £271,399.

Although the taxpayer succeeded before Mr. Justice Finlay, the Crown obtained a majority judgment in the Court of Appeal. The judgment in favour of the taxpayer was restored by the House of Lords. Lord Atkin, in a judgment in which all the other noble and learned Lords concurred, stated that actual cost implied the cost to the taxpayer regardless of whether the money had come out of the taxpayer's pocket or had been given to him by some third party for the purpose. The actual cost to the person was the same thing as the amount expended by the person, the source from which the money had been obtained being immaterial.

The judgment is of obvious importance to all Statutory Public Utility Undertakers which have obtained Treasury assistance in respect of plant and machinery.

Correspondence

Solid Smokeless Fuel

SIR,—I have read with much interest the Editorial Notes in your issue of March 6 with reference to the question as to what type of solid smokeless fuel the Gas Industry should market. It is unfortunate that the Gas Industry has been so apathetic in this matter. There is clearly a vast field for a good solid smokeless fuel suitable for use in the ordinary open domestic grates as now existing in thousands of houses. Such fuel must be capable of giving complete satisfaction to the consumer. Its cost must compare favourably with that of coal; and as far as the Gas Industry is concerned, its manufacture and sale must not involve any loss compared with the ordinary process. I think it can be claimed that these conditions have been fulfilled in the case of the fuel "Dryco," which is made by high-temperature carbonization at Liverpool.

The satisfaction of the consumer is shown by the fact that repeated orders for weekly or monthly quantities are received from a large number of customers, and the sales are steadily going up, notwithstanding the fact that there has been very little advertising, as will be seen from the following figures:

	Quantity Sold.
1931	3,134 tons
1932	7,390 ,,
1933	10,784 ,,
1934	15,599 ,,

The price of "Dryco" is very reasonable, being 41s. 8d. per ton delivered in bags in the Company's area of supply, which compares favourably with the price of coal, and there is a good margin of profit compared with the ordinary process.

Yours, &c.,
R. E. GIBSON,
Chief Engineer.

Liverpool Gas Company,
Duke Street, Liverpool,
March 11, 1935.

Gas-Operated Wireless Sets

SIR,—The *Sunday Dispatch* of March 10 had a few paragraphs, in the usual "marvellous" style to be sure, on the "secret of the gas wireless set."

It may be a mare's nest, but, of course, there *is* a possibility that research might result in the production of a gas wireless set, and if it did the 60% of the homes of Great Britain that are "dependent on gas for lighting" could be preserved for gas, and electricity would not find an entrance into many of them *via* the all-mains wireless set, as it is doing at present.

I write to suggest that it would show the National Gas Council or the B.C.G.A. a better return than any or all of their present activities if by spending a thousand or two in research they made it possible to put a satisfactory Gas Wireless Set on the market; and if their research did result in some manufacturer or experimenter making colossal profits out of the results of their work, what would that matter, if 60% of the homes of this country were preserved for gas?

If anything of this sort is to be done, it must be done quickly, for all-mains wireless has already begun to invade these homes, and in a year or two it will be too late, and the Gas Industry then might as well sleep on.

Yours, &c.,
"SLEEPY."

March 11, 1935.

[The paragraphs to which our correspondent refers are reproduced in our news columns to-day.—ED., "G.J."]

Personal

Mr. Thomas Brown, whose retirement from the position of Engineer, Manager, and Secretary of the Matlock and District Gas Company, was recorded in last week's issue of the "JOURNAL," is succeeded in the Managership by Mr. G. R. DONALDSON, who has been with the Tunbridge Wells Gas Company.

* * *

Mr. J. MURRAY GRAMMER, of the Gas Light and Coke Company, gained a First-Class in the City and Guilds of London Institute Examination in Heating and Ventilating Engineering Design, Final Grade, and became eligible for the prize offered by the Institution of Heating and Ventilating Engineers.

Obituary

The death occurred on March 5 at the age of 73 of Mr. DAVID BROWN, a Director of Montrose Gas Company, Ltd.

The British Gas Federation

Exhibitions Committee

The Council of the British Gas Federation has discussed the question of National Exhibitions, and has appointed the following Committee:

Mr. W. Dieterichs,
Mr. J. Jamieson,
Mr. Stephen Lacey,
Mr. H. D. Madden,
Mr. T. P. Ridley,
Mr. R. J. Rogers,
Mr. A. P. Ryan,
Mr. W. J. Sandeman,
Mr. C. S. Shapley,
Mr. A. W. Smith,
Dr. E. W. Smith,
Mr. H. C. Smith,
Mr. J. Sandon Stubbs,
Mr. H. M. Thornton, and
Mr. Douglas Turner.

Mr. W. D. Rowe to act as Convener.

This Committee has received wide terms of reference, and representing, as it does, the whole of the Gas Industry, will deal with the representation of gas in all National Exhibitions.

The Committee has held a preliminary meeting, at which a discussion of general procedure took place.

Fuel Blending

The Sandwich System

On Feb. 27, Mr. A. C. Pallot, before the Institute of Fuel, gave a Paper dealing with Boiler Practice in H.M. Office of Works, with special reference to the use of Blended Fuels. In the course of the discussion Mr. E. W. L. Nicol, Technical Adviser to the London and Counties Coke Association, said that in the Gas Industry the practice of blending gaseous fuels possessing different characteristics and calorific values had long been established and reduced to an exact science; but the practical and commercial advantages of blending solid fuels, with a view to improving thermal and commercial efficiency, and preventing smoke emission, were probably not fully appreciated.

The author had not mentioned the advantages which are known to accrue from blending high-volatile coal and low-volatile coke; but he had mentioned the patent Sandwich system of fuel blending which was installed at the L.C.C. Greenwich Tramway Power Station during the acute coal shortage which occurred towards the end of the War.

As the inventor and patentee of the Sandwich system of fuel blending, which he developed and brought into use, with coke-breeze, at the Thornhill Power Station of the Yorkshire Power Company, during the coal strike of 1912, Mr. Nicol thought members might be interested in a further reference to this system of blending. The first installation, in London, was made at the Greenwich Tramway Power Station, in 1918, to facilitate the use of coke on chain-grate mechanical stokers, and in order to make up for the shortage of coal at that time. The weekly coke consumption amounted to 1,000 tons, or one-third the total fuel consumption. This system was at that time adopted also at the Stuart Street Station, and, later, at the Barton Power Station of the Manchester Corporation, and also at the Deptford West Power Station of the London Power Company, as well as at a number of other power stations, several of which had since claimed the lowest fuel cost per unit generated and the highest thermal efficiency.

In an official report on the Greenwich Power Station installation, it was stated that "the results had been extremely satisfactory, and had led to a large proportion of coke being burnt with coal, and a considerable saving on the cost of fuel. Owing to the increased use of coke and coke breeze a saving of about £8,000 a year would be effected, and apart from the financial saving, low-grade classes of fuel could be dealt with on the Sandwich system at a much higher efficiency than would be the case if burnt separately." In a further report it was stated that "after 18 months' experience of the Sandwich system of fuel blending on a large scale at a power station using on the average 3,000 tons of fuel per week, I have come to the conclusion that the use of this system has introduced quite a new line of thought in fuel use, which has many important advantages from both the commercial and the national points of view. Equipped with divided overhead storage bunkers to contain, separately, coal and coke, and other facilities for blending at the boiler furnaces, the combinations which can be secured are practically infinite. By means of a simple system of trial and error, the most advantageous mixture, having regard to price and all other factors, is readily determined, and a high thermal and commercial efficiency can thus be obtained which, without the control and elasticity incidental to the Sandwich system, would be impossible."

It should be pointed out that, with a simple and intimate mixture of coal and coke in any considerable proportion, it had been proved impossible to maintain continuous ignition on chain-grate stokers. This difficulty had been overcome by feeding the fuel to the furnace on the Sandwich system in well-defined layers of any required depth, the coal being uppermost.

According to the most recent report of the Electricity Commissioners, the coke and breeze consumption at electric generating stations now exceeded 230,000 tons per annum. Probably few were aware of this important business relationship between the gas and electricity supply industries, which was brought about by the development and introduction of the Sandwich system of fuel blending in 1918, and which, year by year, tended to increase.

Mr. Nicol concluded his remarks by saying that in view of the increasing amount of gas coke that is cut and graded for domestic heating purposes, and the consequent increase in breeze production, the quantities of small coke and coke breeze available for blending purposes should tend to increase.

Forthcoming Engagements

March.

14.—Midland Association.—Meeting at Grand Hotel, Birmingham. Presidential Address of Mr. A. Roberts, of Hereford.
15.—Southern Association (Western District).—Commercial Meeting, Rougemont Hotel, Exeter, 2.30 p.m.
15.—London and Southern Junior Association.—Meeting and Paper by Dr. F. J. Eaton.
16.—Wales and Monmouthshire Junior Association.—Meeting at Newport. Paper by Mr. H. Canning, Jnr.
16.—Western Junior Association.—Meeting at Bath.
18.—Midland Gas Industry Dinner and Dance, Tony's Ballroom, Birmingham.
20.—Manchester and District Junior Association and Yorkshire Junior Association.—Joint Visit to Sheffield.
20.—B.C.G.A.—Executive Committee Meeting, 11.30 a.m.; Special Meeting of General Committee, 2.15 p.m.
21.—I.G.E.—Refractory Materials Joint Committee, 2.30 p.m.
22.—Southern Association (Eastern District).—Meeting at 28, Grosvenor Gardens, 2.30 p.m.
22.—Manchester District Association.—Annual Luncheon, Midland Hotel, Manchester, 1 p.m., followed by the Annual Meeting, 2.30 p.m.
23.—Scottish Junior Association (Western District).—Annual Business Meeting. Paper by Mr. J. L. Crossley.
27.—B.C.G.A.—Annual Meeting of Members in Scotland; North British Hotel, Edinburgh, 2.30 p.m.
28.—Southern Association.—Annual General Meeting, Hotel Metropole, London. Presidential Address of Mr. E. L. Nicholas, of Guildford.
29.—I.G.E.—Joint Lighting Committee, 2.30 p.m.

April.

2.—I.G.E.—Research Executive Committee, 2.30 p.m.
4.—B.C.G.A.—Eastern District Meeting, Peterborough.
4.—Midland Junior Association.—Meeting and paper by Mr. F. H. Lesley.
5.—North British Association.—Spring Meeting at Dunfermline.
5.—B.C.G.A.—Annual Meeting of Gas Salesmen's Circles, Caxton Hall, S.W. 1.
6.—Manchester and District Junior Association.—Meeting at Manchester. Paper by Mr. H. Partington.
6.—Scottish Junior Association (Eastern District).—Visit to Kirkcaldy. Paper by Mr. J. M. Dow.
8.—I.G.E.—Finance Sub-Committee, 1.45 p.m.
8.—I.G.E.—Membership Sub-Committee, 2.30 p.m.
8.—I.G.E.—General Purposes Committee, 3.15 p.m.
8.—I.G.E.—Benevolent Fund Committee of Management, 4.30 p.m.
9.—I.G.E.—Council Meeting, 10 a.m.
9.—I.G.E.—Education Committee, 4 p.m.
10.—I.G.E.—Education Executive Committee, 10 a.m.
13.—Yorkshire Junior Association.—Meeting at Bradford. Paper by Dr. H. A. Fells.
20.—Wales and Monmouthshire Junior Association.—Annual General Meeting.
27.—I.G.E.—Examinations in Gas Engineering.

News in Brief

Price Reduction.—Hawick Gas Company have reduced the price of gas, sold through prepayment meters, by 5d., now making it 4s. 1d. per 1,000 c.ft.

An Attractive Stand at the annual Trades Exhibition of Blackpool Chamber of Trade was organized by the Blackpool Corporation Gas Department.

A Symposium on Welding.—Under the auspices of the Iron and Steel Institute, a symposium on the welding of iron and steel is to be held on May 2 and 3, 1935.

South Shields Dividends.—The dividends paid by the South Shields Gas Company were for the half-year ended Dec. 31, and not, as we erroneously stated, for the year.

The Production of Gas by the Ruhr Gas Company, of Essen, Germany, during the past year amounted to 49,384·7 million c.ft. against 38,018·1 million c.ft. in 1933—an increase of nearly 30%.

Applications are Invited for the position of Assistant Engineer and Manager to the Borough of Morecambe and Heysham Gas Department. This appointment carries a commencing salary of £300 per annum.

Blackburn Jubilee Floodlighting.—Blackburn Corporation Gas Committee propose floodlighting a portion of the Cathedral and the statue of Queen Victoria on the Boulevard during the Jubilee celebrations.

Dundee Floodlighting.—Dundee Town Council decided on March 4 to floodlight with gas the front of the High School and Broughty Castle on the evening of May 6 in connection with the Silver Jubilee Celebrations.

In Response to an Application from the Secretary-Superintendent of the Doncaster Royal Infirmary the Doncaster Gas Committee have agreed to the supplying of free gas in connection with a bazaar to be held in aid of the Infirmary.

Cookery Classes for Business Girls.—The Bradford Corporation Gas Department began on March 12, at the showrooms at Britannia House, Leeds Road, a series of six weekly classes in modern cookery methods, intended specially for business girls.

Plymouth Gas Department have drawn our attention to an error that occurred in last week's "JOURNAL." The Gas Department have recently reduced the price of gas in their Devonport area and not, as we were misinformed, at Stonehouse, which is outside the Department's area of supply.

A Widespread Electricity Failure affected many parts of North London last Saturday night, including Muswell Hill, Crouch End, Highgate, Stroud Green, Finsbury Park, Harringay, and Hornsey, as a result of a fault at the local electric power station. The breakdown varied in length from fifteen to forty-five minutes in the different districts.

Much Public Interest was manifested in the exhibition of cooking, heating, and lighting appliances and the cookery demonstrations staged last week at the Temperance Hall, Totnes, by the Totnes and Bridgetown Gas Company, Ltd. The exhibition involved some speedy work by the employees of the Company, under the direction of the Manager and Secretary, Mr. E. Samuel, since the Hall was only available three days before the exhibition was due to open.

Airdrie Housing Scheme.—Lanarkshire County Council has agreed to extend the mains and provide gas cookers and gas-heated wash boilers for 40 houses being erected at Plains. Airdrie Gas Department are to extend the mains at their own cost and lay the services from the mains to the meter inlets, the County Council paying the cost from the street line to the inlets. The Gas Department will also provide the meters and the County Council will supply the cookers and boilers.

Cookery Demonstrations were held recently by the Padstow and St. Colomb Gas Company, in conjunction with the Parkinson Stove Company, Ltd., and created considerable local interest. Miss Helen Crawford-Fox, M.C.A., of Parkinson's, gave a series of demonstrations and acted as judge in a cake-baking competition. An excellent display of Parkinson appliances was on view. Apart from the success of the cookery demonstrations it is interesting to note that gas also proved itself a sure medium for lighting, for in a nearby hall a concert was held up for half an hour owing to failure of the electricity supply.

The Manchester Gas Committee has contributed £2,500 towards the cost of the Jubilee celebrations, and although the part the Gas Department is to play has not been decided, we understand that the Art Gallery will be floodlighted by gas and possibly the Cathedral also. Also in connection with the Jubilee celebrations it is proposed to hold an exhibition in the Free Trade Hall displaying the various activities of the Corporation and contributed to by all public departments in Manchester.

The Latest Example of a carburetted water gas plant being installed to work in conjunction with vertical retorts is to be found at Paisley, where the Corporation have accepted the tender of Messrs. Humphreys & Glasgow, Ltd., for an automatically-operated C.W.G. plant having a daily capacity of 750,000 c.ft. The new plant will be of the latest type and will be an auxiliary to the vertical retorts to take up peak-loads, to supplement capacity when retorts are down for repairs, and to meet emergencies.

Birmingham Master Gas Fitters' Association, accompanied by their ladies, paid a visit on March 6 to the Works of the Parkinson Stove Company, Ltd., Birmingham. Subsequently, by invitation of the Directors, refreshments were served in the Staff Mess Room. The Managing Director, Mr. R. J. Rogers, expressed the hope that the members had been interested in all they had seen, and Mr. L. Proctor, President of the Association, moved a vote of thanks to the Company for arranging the visit.

A New Lamp—Parkinson's new "Derby"—has been experimentally installed at Belper by the Local Urban Council Lighting Committee. The Chairman of the Committee, Mr. J. E. Bennett, was invited to inspect some lamps by the Derby Gas Light and Coke Company, and he was very impressed by the performance of Parkinson's lamp. The brilliance of the installation is very favourably commented on in the *Belper News* for March 8, which says that "any town equipped with such lamps would have every reason to be proud of its lighting."

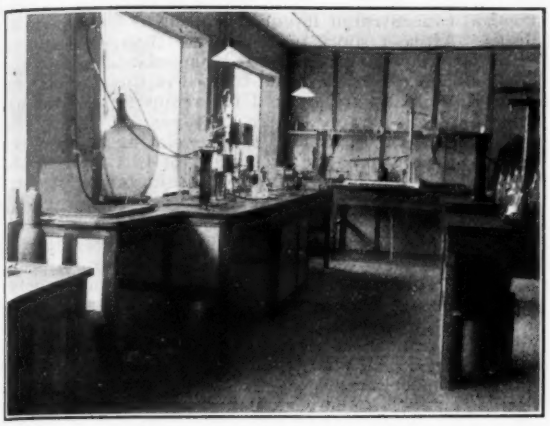
Northampton and Olney.—The Northampton Gaslight Company have taken over the Olney Gas Light, Coke, and Coal Company, Ltd., which was founded 81 years ago and has proved very prosperous. It is understood that there is a likelihood of the Turvey Gas-Works also changing hands. The Olney Gas Company will continue under the same name with the Directors of the Northampton Gaslight Company holding office. Mr. J. Johnson will continue as Director and the Secretary and Engineer of the Northampton Company will hold similar positions in the Olney concern. Practically the whole of the shares have been taken over by the purchasing Company.

The Tender of Messrs. Sayers & Co., Belfast, for relaying gas mains has been accepted by the Omagh Gas Department. The clerk intimated that since the estimates were drawn up for putting the Gas-Works and mains in order, the price of materials had increased, and the loan of £4,600 sanctioned by the Ministry would not be sufficient, and he pointed out that under the new Act it was not necessary to hold an inquiry. The Council was empowered to borrow from £30,000 to £45,000. When the increased loan was applied for the Ministry's inspector examined the Works, and on his report the increased loan was approved. It was decided to borrow the additional amount required.

Union Syndicale de l'Industrie du Gaz en France.—It is announced that the Fifty-eighth Congress of the Gas Industry of France will be held at Marseilles, by invitation of the Gas and Electricity Company of Marseilles, on June 3, 4, and 5 next. The first day will be occupied by the general meeting of the Syndicat Professionnel and the official assembly of the Union Syndicale, which will be followed by the general meeting of the Société pour le Development de l'Industrie du Gaz en France. The next day's programme will consist of the general meeting of the Association Technique de l'Industrie du Gaz en France, at which will be presented various technical communications, to be followed by a visit to the Gas-Works of the Marseilles Gas and Electricity Company. The third day's programme is to include further technical papers, and in the evening a banquet given by the same Company. A cruise on the liner "De Grasse" has been arranged for members and their friends, which will sail from Marseilles on the evening of June 5. The Congress will be held under the Presidency of M. Prosper de Lachomette, of Lyons.

Association of Public Lighting Engineers.—The Twelfth Annual Meeting and Conference of this Association will be held in London during Sept. 9-12, 1935. The Association is thus returning to the City in which its first Annual Conference took place about ten years ago and every effort will be made to render the forthcoming Conference an exceptionally important and successful one. Opportunities of seeing some of the chief features of the Public Lighting of London will be afforded. The Headquarters of the Association will be at the Hotel Metropole (Northumberland Avenue, W.C.), where all meetings will take place.

A Technical Gas Laboratory in Denmark



Many who recall the long association of Mr. Harald Nielsen with the Gas Industry in this country will be interested to learn of his present activities now that he has returned to his native land. Mr. Nielsen has joined forces with a friend, Mr. Carl Hahn, and together they have established a Technical Gas Laboratory in Copenhagen—so far the only private enterprise of its kind in Scandinavia. Their aim is to make the Laboratory a clearing house for technical information concerning the Gas Industry in that part of the world, to collect data, and carry out investigation work. During the past nine months or so Mr. Nielsen and his collaborator, in addition to their general work, have been carrying out specialized research into certain subjects, the results of some of which we shall shortly be in a position to report in the "JOURNAL."

Belfast Loan Application

Mr. J. D. Smith, Engineer, Manager, and Secretary of the Belfast Gas Department, was the principal witness before Mr. J. D. Bates, M.Inst.C.E., the Ulster Home Office Chief Engineering Inspector, who held an inquiry into application for power to raise a loan of £100,000 to meet anticipated capital expenditure in the development of the Gas Undertaking.

Mr. Smith said the reason for borrowing rather than taking the money needed from revenue was the rapidity of the increased business. They could not hope to meet that demand out of revenue. For a number of years they had utilized the surplus profits of the Gas Undertaking in financing capital expenditure. During the five years ended March 31, 1934, £144,793 had been contributed for that purpose out of revenue, in addition to £9,837 transferred from the contingent renewal fund, £4,126 from depreciation account, and an unemployment grant of £1,882. The amount expended was £257,275; the revenue £144,793; the capital from previous loan £96,638; unemployment grant £1,882; depreciation £4,126; and contingent renewal fund £9,837. The last loan of £150,000, he continued, had been sanctioned by the Ministry on Nov. 16, 1926. They now asked for sanction to borrow £100,000, which was estimated to cover the ordinary capital expenditure for the next two years.

The total capital expenditure on the Undertaking to date was £2,099,966; £928,976 of that amount was still outstanding. Against that there was £232,849 in the reserve funds. The indebtedness was thus reduced to £509,046 or, roughly, to less than one-fourth of the outlay. The Undertaking had been a most profitable concern since it had been taken over by the Corporation in 1874. The total net profits since that date after paying interest and dividends were £2,479,508. Of that sum £1,814,356 had been used for purposes in connection with the Undertaking, such as redemption of debt, extension of Works, &c., and £647,186 had been used for the benefit of the ratepayers, including £363,255 for dividends and sinking fund of the new City Hall and £224,500 in aid of rates.

"The Filthy Gas"

Manchester's Good Lighting Record

In the *Manchester Evening News* for March 1 there appeared an interesting article on the 270 lamplighters of Manchester who march out of their 19 depôts in various parts of the city every morning and evening to light some 19,000 lamps. It is not to be assumed that all the gas lamps in Manchester are lighted by "Leeries," for over 2,000 are clock controlled, and in a few years' time the Gas Department hope to complete their programme of conversion to automatic control. This move will relieve "Leerie" of his torch, but he will still be kept busy on maintenance work.

A humorous touch is lent to the article by the story that is told of the man who, in common with many Manchester folk, was in the habit of giving electricity more than its due. He was particularly impressed by the fine gas lighting in St. Peter's Square, and, after gazing upwards in admiration, he turned to an utter stranger who stood beside him and remarked: "A lot better than the filthy gas—this!"

The Manchester Gas Department has nothing to fear from electricity, and in this connection the *Manchester Evening News* says: "and when the electricity people become too talkative they are squashed by the fact that never during a period of more than 100 years has the Manchester street lighting failed to the extent of a 'black-out.'"

"Specification," 1935 Edition

Reviewed by "Critic"

Manufacturers of gas burning equipment should carefully weigh certain editorial remarks prefaced to the 37th edition of "Specification" (The Architectural Press, 9, Queen Anne's Gate, London, price 10s. 6d.). The editor points out that although every effort is made to provide the most up-to-date information under the various heads in each successive publication, he must rely upon the co-operation of individual manufacturers and the industries concerned in order to attain this ideal. In view of this frank statement we must conclude that, in these instances where the case for gas is not so comprehensively stated as it might be, such omissions are traceable to the apathetical attitude of the Gas Industry and its associated industries.

Perusal of Mr. Frederick Gibberd's interesting article, "The Equipment of Flats," brings home the truth of the foregoing remarks. Electric lighting fittings are mentioned, *but not gas lighting fittings;* again, gas cookers are mentioned, but it is also stated that in electric cooker ovens *the natural juices are retained in the foodstuff;* the moral is obvious.

Another informative special article of current interest is devoted to "Covered Sports Courts." In view of recent developments in the production of gas lighting fittings for indoor sports courts it is galling to read herein that "light for each court should be preferably *electric* of approximately 1,300 C.P."

On the other hand, it is gratifying to find that since the last review the important ventilating attributes of gas lighting receive attention where the lighting of churches and public buildings is considered. In the Heating and Ventilating Section the automatic coke boiler is now also well described and illustrated.

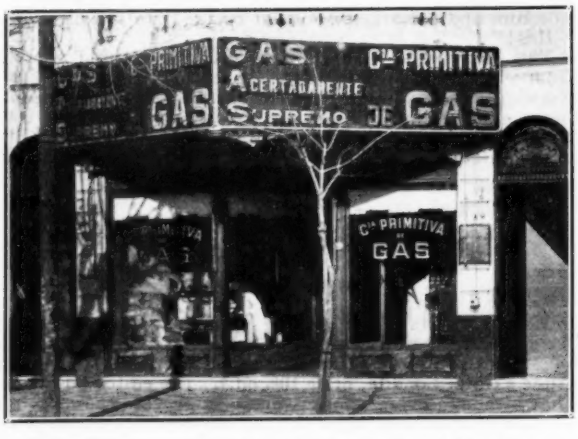
A feature of outstanding importance this year is that wherever possible the recommendations of the British Standards Institution are fully recognized. It is, therefore, rather singular that in the "Gas Engineer" subsection dealing with "Carcassing" no mention is made of the Institution of Gas Engineers' Specification for gas tubing, which is a recognized standard in gas engineering circles at any rate.

Every gas salesman should study the tables dealing with the power consumption and costs of typical electrical appliances which adorn the Electrical Engineering pages. Comparative data on a similar basis relating to gas appliances might with advantage be included in the Gas Engineering pages of future editions. Many members of our Industry will feel that, to do justice to any such compari-

sons, the therm (100,000 B.Th.U.) is possibly too clumsy for rating purposes, and that the time is opportune for the introduction of the small gas unit of 4,000 B.Th.U. as an official measure of potential gaseous energy more in line with the potential energy in the electrical unit. In such case, again, the gas appliance manufacturer might be expected to co-operate by providing definite B.Th.U. or gas unit ratings for individual gas appliances so that the suggested comparative data would be thoroughly up-to-date and of maximum service to the busy architect. The running costs per hour of the various electrical appliances are calculated at ½d., 1d., and 1½d. per unit so that the reader can immediately read the running costs under the appropriate figure. When we consider that the equivalent prices per small gas unit are equal to 1s. 0½d., 2s. 1d., and 3s. 1½d. per therm respectively there appears to be ample justification for the introduction of the 4,000 B.Th.U. unit to our friend the architect in the near future.

The 37th edition of "Specification" contains the usual mine of concise information so acceptable to those interested in modern constructional developments, while the advertisement pages present much valuable information and are a credit to advertiser and publisher alike. The issue now available should find its way into the library of all progressive gas undertakings.

Gas Publicity in South America



During the past ten years there has been a remarkable recovery in the use of gas for cooking and heating, as well as for general commercial purposes in Buenos Aires, the success achieved being due to the enterprise of the Primitiva Gas Company of Buenos Aires, Ltd., who leave no stone unturned to keep the advantages of gas before the notice of the public. To this end, the Company maintain, in different parts of the city and its suburbs, no fewer than eight showrooms—an exterior view of one of which we give above—in the windows of which particularly attractive displays are arranged at regular intervals. In addition, fortnightly lectures and demonstrations are given in a large room specially set apart and equipped for the purpose at most of the showrooms. As an indication of the progress that has been made by the Company, it is interesting to mention that the annual production of gas has increased from 1,442,111,000 c.ft. in 1925, to 2,547,017,000 c.ft. last year.

"Wireless Sets Operated by Gas"

We reproduce without comment the following paragraphs published in the *Sunday Dispatch* of March 10 under the name F. G. Reekie:

Within a year or two, or perhaps before, wireless sets operated by gas may be as common as electric mains sets.

Gas research engineers have discovered that if two dissimilar metals are placed end to end and one is heated, a current of electricity is generated between the two metals.

That, in a nutshell, is the secret of the gas wireless set.

One metal is heated by gas. The other is air-cooled.

The research engineers are now trying to discover which metals generate the most electricity by these means.

A gas wireless set would be a boon to millions of listeners now using battery-driven sets.

It is estimated that 60% of the homes of Great Britain are dependent on gas for lighting, and have no electrical supply.

Scottish Junior Gas Association (Western District).

Visit to the Provan Chemical Works, Glasgow

On Saturday, Feb. 23, some forty members of the Association visited the Provan Chemical Works of the Glasgow Corporation Gas Department. Since the Department assumed control in 1920, the Provan Chemical Works have been re-organized and extended to deal with the increased quantity of crude tar and ammonia liquor from Provan Gas-Works, and also the distillation products from the Department's Works at Dawsholm, Dalmarnock, and Tradeston.

The liquid bye-products are received from the Provan Gas-Works by pipe line and discharged into an underground well. Into this well also are received the rail tanks of crude concentrated liquor produced at the three other Works. After a short period for settling, the ammonia liquor is pumped through the dephenolating plant where the phenols are extracted and treated in the carbolic plant. Up to 1930, no plant existed for removing the tar acids from the spent liquor, but in that year Messrs. Holmes, of Huddersfield, built the first dephenolating plant for Manchester Corporation—the first plant of this kind in Great Britain. After due consideration, a similar plant, but of larger capacity, was erected at the Provan Chemical Works, and is the second of its kind in this country.

The ammonia plant was originally designed for the manufacture of sulphate of ammonia by Messrs. Ernest Scott & Co., Ltd. There are two units, each having a capacity of 70,000 gallons of ammoniacal liquor of 1% strength per 24 hours; equivalent to 12·5 tons of sulphate of ammonia. With the stronger liquor the present daily production is much greater. All pumps on this plant are steam driven and the exhaust steam goes direct to the stills. The plant is so designed that the various units are interchangeable.

The sulphate plant has been adapted for the manufacture of liquor ammoniæ, and may rapidly be turned into use for this purpose. One of the stills functions as a decarbonating tower and the other as a finishing still. The purified ammonia gas is absorbed in four receivers charged with town water. The capacity of the plant working the liquor ammoniæ is 33 tons of 25% solution for 24 hours. The stills are automatically controlled by "Arca" temperature regulators.

In the tar stills section the crude tar is pumped from the underground well to three main storage tanks, having a total capacity of 1,625,000 gallons, for further settling. Originally the whole bulk of the tar in each storage tank required to be heated to raise the temperature sufficiently for pumping. By installing a small heater adjacent to the main storage tank, only the amount of tar necessary for immediate use requires to be heated. This arrangement has resulted in a large saving of steam. Coke breeze is the only fuel used at the stills.

Other plant at the Provan Chemical Works includes a continuous "Dorr" system caustic soda plant, a triple effect evaporator, carbonators, a battery of three 11 ft. diameter acid stills of the pot type, a Wilton "stripping" plant, two benzole washers of 3,000 galls. capacity, and a pyridine plant, including towers for decomposing and dehydrating alongside a still complete with fractionating column, condenser, and finished product storage.

All drainage from the Works passes through a "Knight & Smith" separator, which removes all oil which will separate out. For steam raising there are five Babcock & Wilcox water-tube boilers. Three are fitted with electrically-driven chain grate stokers and two with steam driven underfed stokers. All the five boilers are fitted with superheaters. The fuel used is entirely low grade coke breeze, the plant being both dustless and smokeless. A steam accumulator having a capacity of 10,000 lbs. steam at a pressure of 120 lbs. discharging down to 30 lbs. allows for any peak loads that take place and enables the Works to be supplied with steam for a considerable period should plant shut down at any time.

After a survey of the Works, the President (Mr. John Greig) asked Bailie McIntosh to convey to the Gas Committee the thanks and appreciation of the Association for making the visit possible, and he also thanked Mr. McLeod, General Manager, and his staff for the capable way in which everything had been arranged.

Mr. Eadie, Works Manager, said that in Mr. McLeod they had a very admirable leader. The staff, having youth on its side was very critical and outspoken, which was good because his primary duty was improvement. Councillor Hugh Campbell said he was sorry that the whole Gas Committee was not present. He also said that for the good of the Industry he thought the members ought to be educated to be gas-conscious.

Reason upon Reason— for installing W-D CONTINUOUS VERTICAL RETORTS

MODERN RETORT HOUSE DESIGN

GOOD WORKING CONDITIONS

HIGH WASTE HEAT RECOVERY

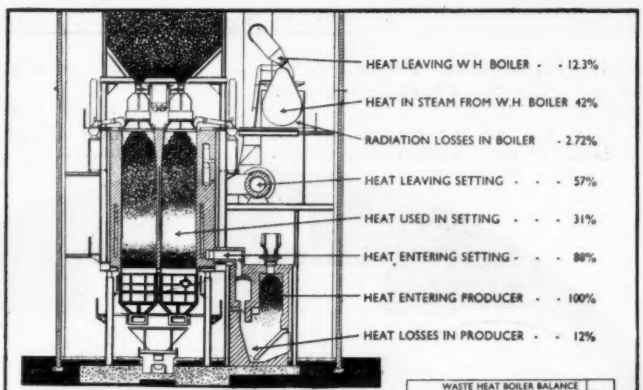
IMPROVED COKE PRODUCTION

EASY & ACCURATE CONTROL

MAXIMUM FLEXIBILITY

LONG LIFE—LOW MAINTENANCE

HIGH THERMAL EFFICIENCY


HEAT LEAVING W.H. BOILER - 12.3%
HEAT IN STEAM FROM W.H. BOILER 42%
RADIATION LOSSES IN BOILER - 2.72%
HEAT LEAVING SETTING - - - 57%
HEAT USED IN SETTING - - - 31%
HEAT ENTERING SETTING - - - 88%
HEAT ENTERING PRODUCER - - 100%
HEAT LOSSES IN PRODUCER - - 12%

WASTE HEAT BOILER BALANCE	
HEAT ENTERING WASTE HEAT BOILER	100%
HEAT IN STEAM RAISED	74%
HEAT IN WASTE CASES LEAVING BOILER	21%
RADIATION LOSSES	5%

HEAT BALANCE OF A TYPICAL INSTALLATION

FACTORS CONTRIBUTING TO FUEL ECONOMY

The design of the W-D Step-grate Producer.

Upward Heating in Vertical Flues gives the best input of heat at every point.

The high development of W-D Waste Heat Boilers.

The supersession of recuperators by the full use of waste heat boilers has resulted in a compact setting design with low radiation losses.

Careful attention is paid to insulation.

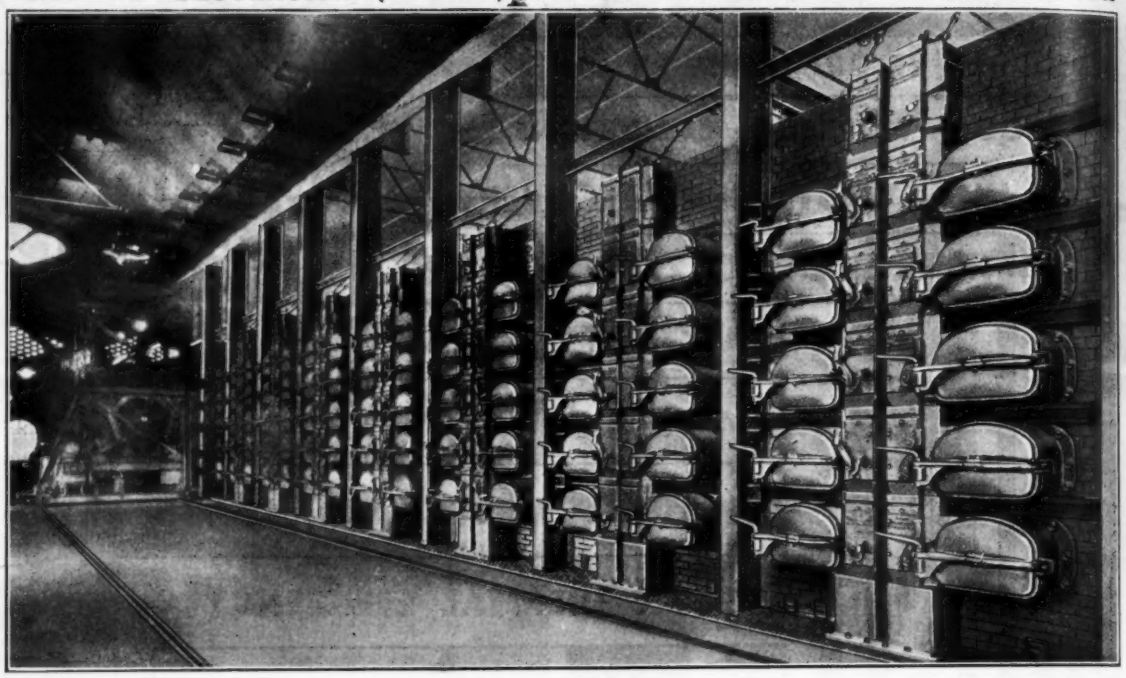
W-D

THE WOODALL-DUCKHAM VERTICAL RETORT AND OVEN CONSTRUCTION CO. (1920) LTD., EBURY & ALLINGTON HOUSES, 136-150 VICTORIA STREET, LONDON, S.W.1

MEMBERS OF THE SOCIETY OF BRITISH GAS INDUSTRIES

MODERN HORIZONTALS

LEVEL-GAUGE **DESCENSION** (SCRUBBER) **OFFTAKE PIPES & FLAT BENCH-COVER**



NO PIPE AUGERING, NO BRANCH CONNECTIONS.

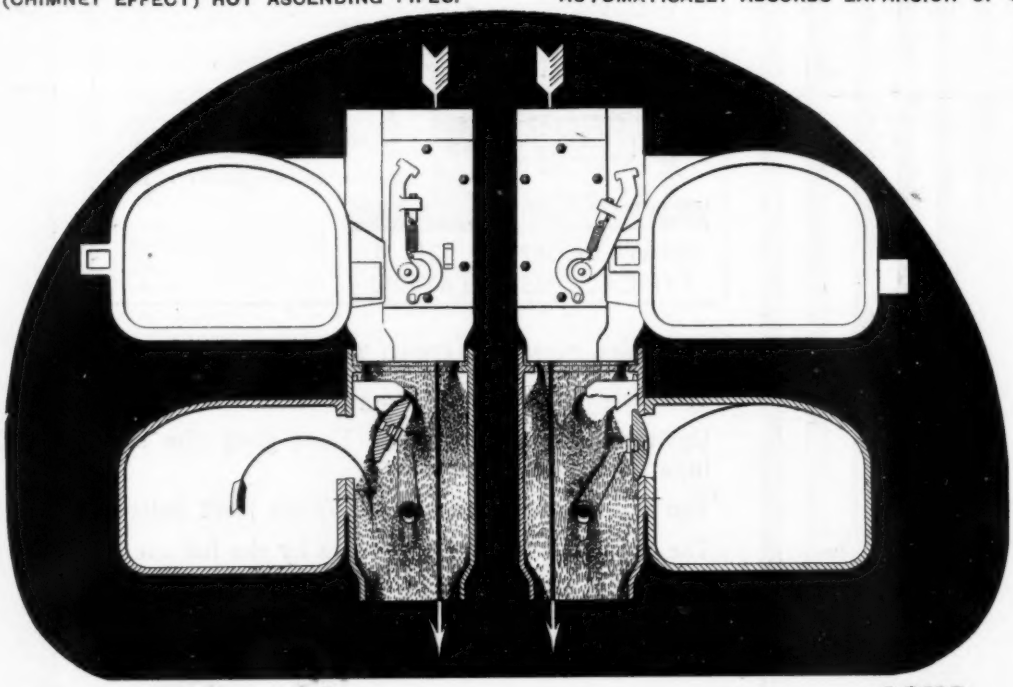
GAS SCRUBBED BY COOLED ATOMIZED SPRAY OF VIRGIN LIQUOR.

NO TENDENCY FOR AIR TO BE DRAWN UP AS WITH (CHIMNEY EFFECT) HOT ASCENDING PIPES.

VALVE WASHED THROUGHOUT CARBONIZING PERIOD.

BENCH-TOP FREED OF ALL MOUNTINGS.

NO MAIN ARCHES, ECONOMIC, FLAT BENCH-COVER AUTOMATICALLY ABSORBS EXPANSION OF SILICA.



ROBERT DEMPSTER & SONS LTD.

Wire: "DEMPSTER" ELLAND **ELLAND.** EST.D 1855. 'Phone: ELLAND 261

LONDON OFFICE: 16, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1

Fine Gas Display at the South London Exhibition

The South Metropolitan and South Suburban Gas Companies have put up a wonderful display this year at this popular Exhibition at the Crystal Palace.

Vesta, Goddess of the Hearth, Dominates the Gas Fire Display.

The South London Exhibition, which opened at the Crystal Palace on March 6, constitutes a minor form of "Ideal Homes" exhibition for the South London district, and is visited by an enormous number of people. Such an exhibition is, perhaps, particularly valuable at the present time by reason of the large increase in the number of new houses in this area. New property owners in their thousands visit this exhibition in order to see all that is latest and best in the way of house furnishing and labour-saving equipment.

In view of this, therefore, it is gratifying to note that gas plays a larger part than ever before at this exhibition; and the South Metropolitan and South Suburban Companies, who are jointly responsible for the stands and exhibits, are deserving of commendation on so excellent a series of displays. In addition to the fact that some forty outside firms are using gas in one form or another in connection with their displays or demonstrations, the Gas Companies' exhibits have themselves been "de-centralized"—if we may use the term—with the result that one can take very few steps at the exhibition without having gas in one or other of its phases brought prominently to one's notice.

So far as the main gas exhibits go, we cannot help feeling that this policy of having one large central display supported by various other gas stands throughout the exhibition has, for the obvious reasons stated in the foregoing paragraph, many advantages from the advertising viewpoint—and, after all, all exhibitions are simply methods of advertising the merits of gas in a practical way. The organizers have, therefore, in this way, set an excellent example for exhibition work.

The Central Exhibit.

The main gas display once again occupies one of the most prominent positions in the centre of the exhibition opposite the chief entrances, and, as though typifying the supremacy of gas, the stand towers above its neighbours and after dark forms a brilliant centre of light.

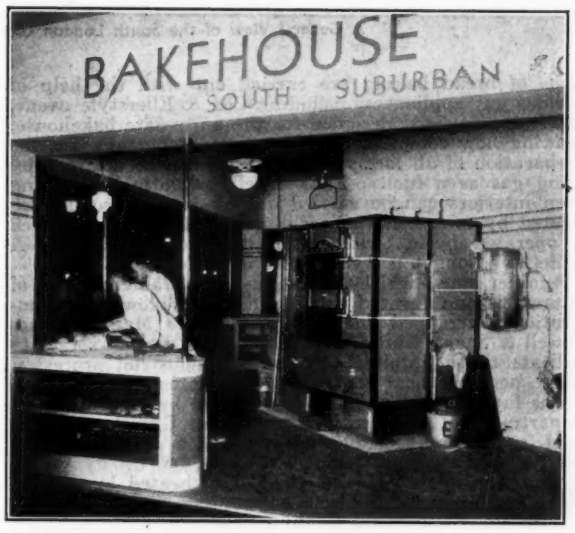
There is little we can say by way of description of the stand which will add to the impressions to be drawn from the accompanying photographs. All the latest labour-saving appliances for the home are shown in pleasing finishes and settings. Coloured fires, radiators, and cookers are prominent as examples of the way in which the Gas Industry is meeting the present-day trend of brightness in the home. Indeed, the exhibit, taken as a composite whole, admirably demonstrates the response to the growing demand not only for clean, labour-saving equipment, but also for units which will definitely enhance the appearance of the modern house, no matter what the room in which they are fitted, and at prices that are within the reach of every purse.

Reference to this main stand would not, however, be complete without mention of the outstanding hot water display. At this exhibition twelve months ago the organizers made water heating the central feature; and on this occasion the same theme has been adopted as the "nerve centre" of the stand, but with a different, and in many ways more striking, treatment. The polished black slate column stands some 10 ft. high, and almost boiling hot water cascades down from the semi-circular chromium-plated troughs in a gradually increasing "apron." The hot water is supplied by a Potterton's "Rex" boiler below the stand, and the whole setting provides a fine optical demonstration of the ease and simplicity with which gas can serve all the hot water requirements of the household.

The "Rex" boiler has an output of 500,000 B.Th.U. and an efficiency of 80%, some 55 gallons of water a minute being pumped round by means of a National 2½ H.P. gas engine driving a 2-in. centrifugal pump.

Emphasis is also laid in the gas exhibit upon the advantages of being able to "plug in to gas," and a large number of such connections are provided, together with a varied range of small gas appliances for use in conjunction therewith—again demonstrating the versatility of gas in the home. Chromium-plated fittings are also more prominent in many directions this year.

A further dignity is added to the stand by the statues taken from ancient mythology set in niches in the four main pillars. One of our photographs shows an example of these, which represent Vesta, the Goddess of the Hearth; Prometheus, the giver of fire; Hygeia, the Goddess of Health; and the Snow Maiden from Hans Andersen. Adjacent to each of these figures are arranged appropriate gas appliances—linking up what the figure stood for in olden times with its present-day counterpart as provided by gas.



The Bakery Exhibit.

Attractive Lighting.

The general lighting of the stand is particularly noteworthy, and switch control for gas fittings—which the visitors are invited to operate freely—is another prominent feature, which serves to indicate that electricity has no advantages over gas in the lighting field either as regards efficiency or controllability. In addition to the illumination of the stand by means of individual units set at regular intervals round the canopy and the pleasing domestic fittings of various types, overhead lighting is provided by powerful lamps set above glass-panelled laylights over the water heating display, while Sugg's directive gas lamps shine upon the flanks of the stand from adjacent balconies, throwing the whole display into a blaze of light which is at once pleasing in effect, restful to the eyes by reason of its colour, and by no means glaring. The whole forms a striking example of the supremacy of gas lighting for all purposes.

While on the subject of lighting, we may mention a further stand which is devoted to a demonstration of the assembly and testing of "Metro" burners, and also of the perfect manner in which the gas flame fits the mantle—indicating yet again the care which is taken to ensure that gas lighting gives first-rate results under all conditions.

Gas for the Baker.

The suitability of gas for the bakery and confectionery trades is exemplified on another stand, where demonstrations of bread baking are carried out with the help of various gas appliances, including Cox & Ellerstyle ovens, which are specially designed for the up-to-date bakehouse, showing how complete cleanliness—so important in the preparation of all forms of foodstuffs—can be attained by using gas as a fuel. That effective lighting of baking oven interiors can be carried out by gas is also demonstrated by means of the gas-illuminated light-box, which is operated by a switch fitted on the oven front. A "Metro" doughnut fryer is also in evidence.

Another stand which attracts a considerable amount of interest is one devoted to practical glass-blowing demonstrations, arranged in conjunction with Messrs. James Powell & Sons (Whitefriars), Ltd. This display serves to indicate the adaptability of gas for industrial processes, where accurate heat control is of paramount importance. A gas furnace designed and constructed by the Industrial Department of the South Metropolitan Gas Company is used for melting the raw material, and a pyrometer indicates a steady working temperature of 1,400° C.

Alongside is an annealing lehr, also heated by gas, in which the products are placed to cool scientifically in order to ensure a satisfactory finished article.

An illustration of gas as the modern fuel for the kitchen is provided by a novel exhibit showing the kitchen of fifty years ago compared with that of to-day. In the latter, a gas cooker, refrigerator, washing machine, sink water heater, and iron show in a very practical way the enormous difference gas makes in the amount of work involved in the running of the up-to-date kitchen.

An All-Gas House.

Finally, as a complete illustration of the sum total, as it were, of all the services gas can perform in the modern home is, for the first time at this exhibition, an all-gas house, with every domestic application of gas, including lighting, switch-controlled throughout. A "Metro" inset coke boiler is provided in the dining-room, inset gas fire in the drawing-room, full equipment in the kitchen, while in the bedrooms are further gas fires, with a geyser for summer bath water heating in the bathroom.

This house provides an interesting comparison from the health viewpoint with the all-electric house next door. In the latter there are no flues at all in the bedrooms, which are heated by electric fires, while in the gas house the gas fire flues provide proper ventilation of the rooms and ensure healthy conditions which are absent in the electric house.

Both these model houses, incidentally, are effectively floodlighted by gas. Other model houses at the exhibition are equipped with Ascot multi-point heaters for hot water supply.

Altogether, it may be said that gas has a truly magnificent showing at the South London Exhibition this year, and the organizers are to be congratulated on a series of displays which must surely redound to the credit of the Industry and prove that gas in the South London area is definitely the "fuel of the future."

A General View of the South London Gas Exhibit, showing the Hot Water "Cascade."

SOME FURTHER EXHIBITS.

An exhibit devoted to gas water heating is that of Messrs. Clarkhills, Ltd., of Vauxhall, S.W. 8., on whose stand are a number of models in operation. Among these is their new "Speedex" heater, which is of particular interest. This machine is fitted into the flow and return of the ordinary coke boiler system and will act in the capacity of a "booster" or will heat the existing hot storage tank when the solid fuel boiler is not in operation, thereby giving a satisfactory dual system with a minimum installation charge and no necessity for a series of stop cocks which are dependent upon the uncertainties of the human element. The "Speedex" is stated by the makers to have a gas consumption of 50 c.ft. per hour, and is finished in oxidized brass or porcelain enamel with chromium-plated fittings.

Another recent introduction by this firm is their

"Apex" storage heater, which is made in two sizes—12 and 15 gallons—and is claimed to be so rapid in action that it will supply hot water for washing up at 140° F. in less than three minutes at a gas consumption of 50 c.ft. per hour—which constitutes quite a remarkable performance. This heater is specially suitable for flats, housing estates, and the small type of house generally, supplying sink, bath, and lavatory basin. It is attractively finished in a cream enamel and can, of course, be lagged if desired for greater efficiency. A number of other gas water heaters of various types are also shown on this stand.

A wide range of gas and coke appliances are to be seen on the stand of Messrs. C. H. Kempton & Co., Ltd., of Bennerley Road, S.W. 11. Most prominent, perhaps, are their well-known "Kaye" coke fires, which have been specially designed for the efficient burning of gas coke. All models are fitted with the patent rocking bar attachment for ensuring a glowing fire and all are ignited by gas. The firm have recently introduced a boiler model which is regulated by means of a patent adjustable damper fitted at the side.

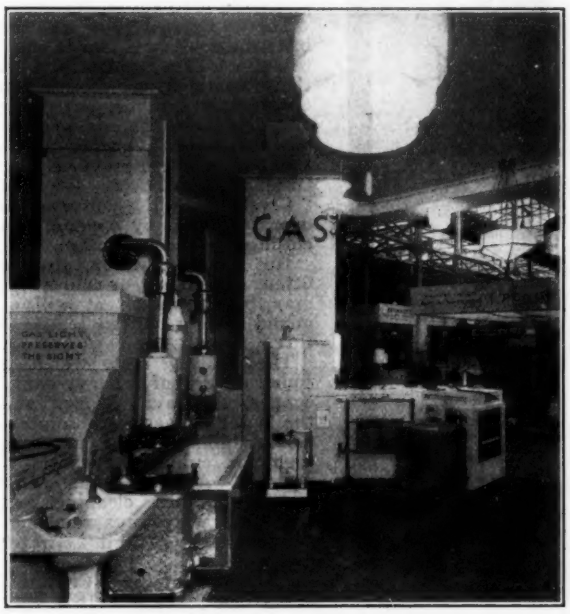
Various models of the firm's "Emscote" gas cooker are also displayed, in mottled enamel finishes, together with a number of their gas fires, these also being in attractive finishes, and some embodying the new type of high radiant.

The "Kempar" two-directional street gas lamp is another interesting exhibit, while for traffic purposes the firm have produced a gas-illuminated traffic bollard which they are supplying under the name of "Guardian Angel." Messrs. Kempton's are understood to be the sole selling agents to the Gas Industry for these traffic refuge posts. An entirely new lighting fitting suitable for domestic illumination, schools, factories, shops, and offices, is also to be seen on this stand. This is called the "Thermolume," and incorporates a Universal burner and enamelled shade in white, yellow, or green—which allows considerable light for illumination on the ceiling. The unit comprises a strong and efficient burner, gallery of aluminium, air regulator, heavy brass bunsen tube, and open or pepper-box nozzle as desired, complete with heat-resisting globe and vitreous enamel shade. A cast-iron superheater is supplied for two and three cluster bijou burners.

Further Coke Appliances.

Further coke appliances are to be seen on the stand of Messrs. SoFono, Ltd., of Purley Way, Waddon, including their new "Southern" grate for burning ordinary gas coke. With the use of the efficient gas lighting burner it is claimed that a brightly glowing fire with flickering flames will be obtained in about three-quarters of an hour, and the fire is stated to burn for three to four hours without refuelling. This grate is finished in vitreous enamel and chromium plate, and its two special features are the ingenious device for removing the ash and the controlled draught. The former device consists of a number of sliding bars which move backwards and forwards in the main bottom grate, operated by the insertion of a poker in a knob provided in the front of the grate. The controlled draught is effected by a specially constructed shutter on the ash-pan front, and provides for full draught and just sufficient air to ensure a bright, glowing fire.

This firm are now manufacturing domestic boilers, two or three of such models being displayed on their stand. These are very attractive appliances, being finished in blue mottled enamel with white side plates. Special provision has been made on these boilers for easy cleaning, four "mud-holes" giving free access to all parts of the boiler. It is stated that these stoves can be kept in for 36 hours without attention by using slightly damped down coke nuts. A special aperture is provided on all models for the insertion of a gas poker for lighting purposes, and the larger domestic models give a B.Th.U. output per hour, it is claimed, of 25,000, with a fuel space of 0·6 c.ft.



A Further View of the South London Gas Exhibit.

So far as the use of gas elsewhere in the exhibition is concerned, we were particularly struck by the fact that one large furnishing stand employed gas throughout for lighting, which bears out a theory which has been advanced on more than one occasion before that gas is particularly suitable for such products—not only by reason of its pure light for proper discrimination of colours and effects, but also because it provides just the right temperature to preserve the woods in perfect condition.

Athletic and Social Activities

Portsmouth Long-Service Awards.

At a variety concert by the "Southsea Cabaret Revellers" in the Oddfellows' Hall, Kingston Road, on Thursday, Feb. 21, presentations were made by the Chairman of the Portsmouth Gas Company, Mr. T. H. F. Lapthorn, J.P., to six employees retiring from active service, five meriting long-service awards, and nine who had earned long-service certificates.

Newport (Mon.) Benefit Society Dinner.

The annual dinner of the Benefit Society of the Newport (Mon.) Gas Company was held at the King's Head Hotel on March 4. Mr. J. H. Canning, O.B.E., J.P., Engineer and Manager of the Company, was in the chair and proposed "The Forces;" Colonel Clifford Phillips responded. "The Chairman and Directors of the Newport (Mon.) Gas Company" was ably proposed by Mr. H. D. Madden, Engineer and Manager of the Cardiff Gas Light and Coke Company, and Mr. R. Wilson Bartlett replied on behalf of the Board. The Vice-Chairman, Alderman C. F. Williams, presented National Safety First Association Diplomas to nine of the Company's drivers, all of whom had passed the test last year. Mr. W. Stanford, Secretary, submitting the toast of "The Society," pointed out that it was founded sixty years ago, and their reserve fund was £712. Since establishment, the Society had paid out £6,787 in sick and funeral benefits, and their contributions to the Royal Gwent Hospital amounted to £2,349.

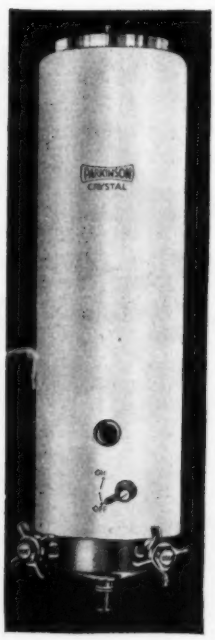
Thomas Potterton (Heating Engineers), Ltd.

The Fourth Annual Dinner and Social of the "Victor" Sports Club—the members of which are the staff and employees of Messrs. Thomas Potterton (Heating Engineers), Ltd.—was held at the Fountain Hotel, Tooting, on Saturday last, when Mr. T. F. C. Potterton, the President of the Club, took the chair in the presence of more than one hundred members and guests. In presenting the prizes to the winners of the various competitions, the President congratulated the Club on the successes of its members in the field of sport.

Notes on Appliances

The "Crystal" Water Heater

The Parkinson "Crystal" water heater is a new introduction in sink water heaters, and its robust construction, its desirable features from a maintenance point of view, and simplicity of fixing should recommend it to gas engineers.



The "Crystal" is of the instantaneous type and is automatically controlled. A thermostatic device working in conjunction with the automatic valve prevents the admission of gas to the main burner unless the pilot has been previously lit. Once the pilot is lit, the "Crystal" will continue to operate simply by opening and closing the hot water tap.

Hot and cold water taps are fitted, so that hot or cold water may be drawn off at will or mixed to any desired temperature.

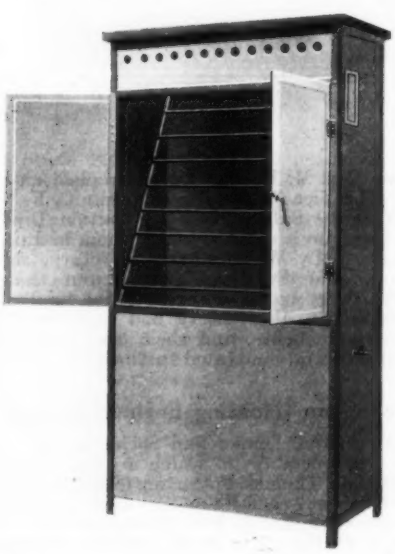
The heating unit, which is constructed of heavy-gauge copper, is heavily tinned and the water delivery is absolutely uncontaminated and may be used for culinary purposes if desired. A detachable water jacket simplifies cleaning and the large waterways render it suitable for "hard" water districts.

The fixing of the "Crystal" is extremely simple. It is only necessary to remove the existing cold water tap and screw the connecting union of the water heater into the socket from which the tap has been removed.

This appliance is attractively finished in white porcelain enamel with chromium fittings. The gas consumption is 30,000 B.Th.U. per hour.

A New Clothes Drying Cabinet

An interesting appliance recently put on the market is a new gas-heated clothes drying cabinet by Cliffdown Appliances, Ltd., of Hastings. At present the cabinet is



supplied in two sizes—a domestic model 6 ft. high by 1 ft. 6 in. deep by 3 ft. wide, and a larger one for commercial use 6 by 2 by 5 ft. We have examined and seen demonstrated the domestic model, and find it attractive in appearance, finished in white enamel inside and green outside, interior and exterior fittings being chromium plated. The domestic cabinet contains 13 and the commercial 16 removable rails extending the full width of the cabinet, conveniently arranged for the hanging of laundry, while galvanized ¾-in. mesh hinged trays protect any falling clothes.

The heating is carried out by two rows of luminous burners on ⅜-in. piping controlled by one tap, and screened by baffle plates which can be moved horizontally by means of a lever, enabling the burners to be lighted with ease. The makers inform us that, when filled to capacity, the domestic model is capable of drying and airing the contents in under three-quarters of an hour. They claim complete combustion, and that therefore no flue outlet is necessary, and that the whole appliance is foolproof, with nothing whatever to get out of order.

A New Instantaneous Water Heater

A new instantaneous gas water heater has been brought out by Messrs. Falk, Stadelmann, & Co., Ltd. This appliance, which is called the "Veritas," is intended for hand basin or sink use.

It has a normal output of half a gallon of hot water per minute, giving at this rating a temperature rise of 105° F. The output can, however, be adjusted to suit the requirement of individual consumers, with, of course, a consequent variation in the temperature rise.

The "Veritas" Water Heater.

The interior of this heater incorporates a corrugated cylindrical design, which sets up a swirling motion in the container. The body is brazed and is of neat and robust construction, while the outer casing of porcelain enamel, with chromium-plated top and bottom bands, is so fitted that the removal of one screw only enables the whole to be lifted off, thus giving easy access to the interior.

The burners of the heater are of the flat-flame type, the nozzles being set in circular formation and so positioned that there is no flame impingement. Each jet is separate, so that replacement is simple. Maintenance costs should be low.

An ingenious safety device has been incorporated in the burner mechanism. The main supply to the burner is controlled on the usual water pressure system, being ignited from a by-pass as soon as hot water is turned on. In the event of the gas supply failing by reason, for instance, of the slot meter running out, while the heater is in operation, there is no risk of an escape of gas when the supply is restored. The by-pass flame plays upon a bi-metal strip, which is so arranged that if the gas temporarily fails, the whole supply is completely shut off within a very few seconds; so that when the gas comes on again at the main it still remains cut off at the appliance. Nor can the by-pass be re-ignited until a spring button obtruding from the front of the heater is depressed while the bi-metal strip has time to come into operation again and lock it in the "open" position, when the heater may once more be used.

This button is so interlocked with the water pressure valve that it cannot be depressed (to enable the by-pass to be lighted) unless the water is first shut off. The same safety device comes into effect, of course, in the event of the by-pass becoming extinguished. The button, additionally, acts as the main tap for the appliance, and on being turned once is released from its lock on the bi-metal strip and, springing back, shuts off the gas supply.

The mechanism includes a water mixing device, so that water at any desired temperature may be obtained from the one outlet nozzle, to which a spray can be attached if required. thus rendering the appliance particularly suitable for hairdressers' establishments.

NOTES ON

Vertical Retort Practice

by
D. E. WEST

This Paper was presented before the Wales and Monmouthshire Junior Gas Association by Mr. D. E. West, Technical Assistant to the Port Talbot Gas Department, at a meeting on Feb. 16.

Following upon the decision of the Council of the Borough of Port Talbot to centralize gas manufacture at their Aberavon Works and close down their Margam Works in 1932, an installation of Glover-West vertical retorts was erected, and put into operation at the first-mentioned Works.

The installation comprised eight Glover-West 30-in. New Model retorts, arranged in units of 2, with two producers of the step-grate type, each capable of supplying fuel gas to the eight retorts. Subsequently, one of the producers was converted to the pressure type for the consumption of breeze.

Intensive sales development rendered an extension necessary in 1934. The following figures show the rapidly increasing demand:

	Gas Made.
For the year ended March 31, 1932	166·1 million c.ft.
,, ,, ,, ,, 1933	179·4 ,,
,, ,, ,, ,, 1934	190·3 ,,
Estimated for 1935	205·0 ,,

The extension consisted of a further four retorts and one pressure producer, so that the plant now in operation comprises 12 retorts in units of 2. Each retort is capable of producing 103,000 c.ft. of 425 B.Th.U. gas per day.

The plant is equipped with complete coal-handling plant and two natural-draught waste-heat boilers of the vertical fire-tube type.

In order to facilitate the mixing of coals two portable band conveyors (also used on the Works for other purposes) are used to feed coal from the wagons to the fixed-bucket elevator of the retort house coal plant. In this way a fairly good mixture is obtained.

Coals Used.

It was decided very soon after the installation of the plant, that as far as possible coal from local mines should be carbonized, on the ground of cost. Approximately 90% of the coal carbonized is mined within the Borough, the cost of carriage being, of course, very low, while the remainder is washed duff, added to strengthen the coke produced by the local coal.

The following is the proximate analysis of the coals now used:

	%
(1) Local Washed "Through" Coal—	
Ash	8·5
Volatile matter	33·0
Moisture	5·0
Coke: Soft and friable, very porous and extremely reactive.	
Coke Shatter Test—	%
On 2 in. mesh	35
,, 1½ ,, ,,	50
,, 1 ,, ,,	66
,, ½ ,, ,,	75
Through ½ in.	25
(2) Washed Duff—	%
Ash	3·5
Volatile matter	29·0
Moisture	10·0
The Grading of the Washed Duff—	%
On ¼ in. square mesh	0·3
Through ¼ in. and over 10 I.M.M. mesh	7·0
,, 10 ,, ,, 30 ,, ,,	71·6
,, 30 ,, ,, 60 ,, ,,	14·0
,, 60 ,, ,, 100 ,, ,,	2·1
,, 100 mesh	5·0
	100·0

(3) Coke produced from a Mixture of—

80% local washed through coal and 20% washed duff.
The coke is fairly hard and dense, and not particularly reactive to steam.
The shatter test is as follows:

	%
On 2 in. mesh	47
,, 1½ ,,	65
,, 1 ,, ,,	83
,, ½ ,, ,,	92
Through ½ in.	8

Objects of Carbonizing Duff.

The objects of using duff are as follows: The addition of 10% to 20% has the effect of strengthening the run of retort coke considerably. It is well washed, has a high gas-making value, and the price is low.

Duff is more difficult to carbonize, but it is sound policy during periods when the full output of retorts in use is not required, to carbonize a comparatively high percentage of this lower priced coal, and reduce the percentage of duff when the maximum gas output is required. It is necessary to mix the duff well with the larger sized coal in order to avoid the trouble of holding up in the bunkers and having unmixed "patches" of duff descending through the retorts. The latter condition immediately results in approximately doubling the steam volume required for water gas production. A large percentage of undecomposed steam then going forward, which has the obvious effect of cooling the descending coke unduly. This condition can to some extent be neutralized by increasing the heat input into the lower combustion chambers, but by the time this can be accomplished the high percentage of duff coke has passed through and normal carbonizing conditions resumed.

On the other hand, steaming can be made more effective by reducing temporarily the throughput on the offending retorts, if holder stocks would permit, but the real remedy is thorough blending of the coals.

Steaming.

When manufacturing low grade gas in continuous vertical retorts, the rate of coal gasified per retort per day depends more upon the rate of efficient water gas production than upon the rate of actual carbonization.

In view of this fact, the temperature of the coke must at all times attain a point where the reaction $C + H_2O = CO + H_2$ will occur. In order to obtain a make of 103,000 c.ft. per retort per day, with the coals in use at Aberavon, it is necessary not only to confine the temperatures of the two lower combustion chambers to a range of 1,300° C. to 1,360° C., but to extend this zone over the five lower chambers.

An actual temperature record is as follows:

Reading from the top of the setting—

	Degrees Centigrade. Max.	Min.
Circulating chamber No. 3	1180	1180
,, ,, ,, 2	1200	1200
,, ,, ,, 1	1220	1220
Combustion chamber ,, 7	1240	1230
,, ,, ,, 6	1260	1250
,, ,, ,, 5	1320	1310
,, ,, ,, 4	1360	1360
,, ,, ,, 3	1340	1330
,, ,, ,, 2	1330	1320
,, ,, ,, 1	1300	1290

The height of the high-temperature zone is approximately 10 ft.

Steaming down to 425 B.Th.U. with these temperatures the CO_2 content of the town gas is kept within from 3·5% to 4·5% using 100% local washed through coals, and within 4·5% to 5·8% using from 10% to 20% washed duff.

For the nine months ending Dec. 3, 1934, the following results were obtained on the plant:

Coal carbonized	6,680 tons
Gas made per ton of coal	22,161 c.ft.
Average calorific value	428·4 B.Th.U./c.ft.
Therms per ton	94·94
Tar made per ton	13·0 galls.
Coke available for sale per ton of coal carbonized	7·5 cwt.
Breeze	*Nil*
Fuel used on Cornish boiler	,,

Having no water gas set we are entirely dependent upon

the flexibility of the vertical retorts in maintaining the necessary gas stocks at peak periods.

The following figures indicate the storage capacity and the maximum and minimum weekly and daily send-out:

Gasholder capacity at Aberavon works	360,000 c.ft.
,, ,, ,, Margam ,,	250,000 ,,
,, ,, ,, Cwmavon ,,	20,000 ,,
Gas manufactured at Aberavon works only:	
Maximum daily output	740,000 ,,
Minimum ,, ,,	380,000 ,,
Maximum weekly output	5,620,000 ,,
Minimum ,, ,,	2,600,000 ,,

With a heavy domestic and public lighting load it is particularly essential that the calorific value, specific gravity, and gas pressure at the consumers' appliances should remain reasonably constant. Constant chemical composition and air/gas ratio are, of course, essential to a satisfactory service.

The plant can be manipulated with ease to cope with a rapid increase in demand. In approximately 9 hours the make per retort can be increased 27% to meet demand.

Retorts are scurfed in strict rotation, each retort being taken off for this operation after 8 weeks' run. After this period the lower sections of the retorts show very little scurf formation. From a point 10 ft. above the base of the "steaming chamber" a thin layer of scurf is found, gradually increasing in thickness to a maximum of 1½ in. near the top mouthpiece.

The plant is equipped with two natural draught vertical fire tube boilers by Spencer-Bonecourt. Their capacity is in excess of the heating capacity of the waste gases from the retort settings and provision has been made for by-passing a supply of producer gas direct from the uptakes to the boiler flues. Sufficient steam is raised in the boilers to supply the needs of the whole Works from waste-heat alone.

Breeze-Burning Producer.

Due to the very effective steaming of a coal mixture with a fairly high ash content, the run-of-retort coke contains approximately 20% breeze, 40% of which is sufficiently fine to pass through a ⅜-in. mesh. In order to use this up, about 150 lbs. of yard breeze is included in each 5 cwt. skip of coke elevated for producer feed.

The producers were originally designed for natural draught, but it was decided to convert one of them for working under pressure. The equipment is simple and cheap. It consists of an air-tight door fitted to the front of the step grate with a steam-jet blower fitted to the base of one side wall. Control is effected by means of a dial thermometer indicating the temperature of the mixed steam and air supplied to the producer, and pressure gauges showing conditions below the step grate and in the base of the uptake.

Steam is supplied to the blower through a reducing valve at about 50-lb. pressure. The pressure below the grate varies with the density of the fuel bed and the nature and amount of clinker formed. It varies from an average of 0·25 in. W.G. immediately after cleaning, gradually building up to as much as 2 in. W.G. after 8 hours.

The fire is cleaned every 8 hours, and during that period the steam admission is increased as the resistance builds up. Usually about six adjustments are required, but it is proposed to fit an automatic control for this purpose.

The saving in cost effected by the use of this breeze in the producer is considerable, as shown by the following figures:

	£	s.	d.
Unscreened breeze used, 728 tons at 5s.	182	0	0
Handling costs, 728 tons at 6d.	18	19	0
Cost of steam raised by waste heat, 128,078 galls. water at 9d. per 1,000 galls.	4	16	0
Total costs	£206	15	0
Less, coke released for sale, 655 tons at 20s.	655	0	0
Total annual saving	£449	5	0

This is quite a conservative statement. As a matter of fact, although 5s. per ton is allowed for the value of the unscreened breeze, it is practically unsaleable in the district. Where surplus heat is not available for steam raising, some further cost for this would, of course, have to be allowed.

Reverting to the problems of the producer the recovery in gas quality after cleaning is very rapid, owing, no doubt, to the high rate of gasification in one producer. The very low figure of 2·6% CO_2 is restored in less than two hours. While, however, it is economical to run one producer only on breeze-coke mixture we have experienced some disadvantages. The reduction in gas volume during cleaning and charging is considerable. We have endeavoured to overcome this by reducing the draught on the setting 30% when the blower is out of action, restarting to normal as soon as it is turned on again. The high rate of gasification gives rise to trouble with dust which is carried forward to the setting in producer gas travelling at high velocities.

In view of these facts it will be necessary to design a producer in two complete sections, that is, with two doors and two blowers, so that a sufficient volume of gas is maintained during cleaning and charging of each section. The dust problem could to a great extent be solved by the introduction of a suitable dust catcher, in conjunction with the specially designed breeze-burning unit.

The settings were originally designed for the carbonization of normal Welsh gas-making coals, but experience with the mixture in use has suggested an interesting modification in the proportion of combustion chambers to circulating chambers.

With the high temperatures which it is necessary to maintain in the lower combustion chambers it is found that more than sufficient heat is carried forward and upward by the waste gases to maintain a sufficient temperature in the circulating chambers. It was, therefore, decided to experiment on one unit with the number of combustion chambers reduced from 7 to 5 and the number of circulating chambers increased from 3 to 5. The result is so satisfactory that it is proposed to make the modification throughout the installation.

While no accurate figures have yet been obtained with regard to the saving in fuel resulting from this modification, the following data indicates that this may be considerable:

Producer gas damper openings reduced	15%
Control dampers reduced	10 ,,

	Chamber Temperatures. Before Modification	After Modification
Original circulating chamber—		
No. 3	1180° C.	1160° C.
,, 2	1200° ,,	1180° ,,
,, 1	1220° ,,	1210° ,,
Original combustion chamber—		
No. 7	1240° C.	1250° C.
,, 6	1260° ,,	1260° ,,

The fact that the temperatures in the circulating chamber are only slightly affected by the modification encourages the anticipation that an increase of approximately 1 cwt. of coke for sale per ton of coal carbonized will be realized when the entire bench is converted to the new arrangement.

In conclusion I wish to express my thanks to my Chief, Mr. E. M. Edwards, for permission to present this Paper to you.

Discussion.

The PRESIDENT (Mr. A. D. Howells, Neath), in congratulating Mr. West, referred especially to the amount of data from actual experiments carried out at Port Talbot.

Mr. D. W. REES (Neath) also made mention of the care with which the results obtained had been logged.

Mr. S. WALKER (Porthcawl) referred to the fact that similar plant had recently been installed at their Works. Much of the information given would be of definite use to them, and they would give a trial to some of the suggested experiments.

Mr. CUNIFFE (Swansea) viewed the results tabulated as being very satisfactory. The plant was new, and no doubt maintenance and repair would have to be taken into account later on. It would then be possible to form a better idea as to the relative costs of verticals as compared with the older methods.

Mr. I. G. JENKINS, in proposing a vote of thanks to Mr. West, congratulated Mr. Edwards and his Staff upon the condition of the Works and the results obtained. He was also impressed by the fact that the bulk of coal used was obtained from local collieries. He regarded this to be the right policy which was justified by the high yields of gas obtained. It was remarkable that notwithstanding the depression, and the severe competition from oil and electricity, they were able to report an increase in output of 25%—viz., from 166 to 205 million c.ft. in four years.

Mr. H. WILLIAMS (Cardiff) seconded, and Mr. W. H. JOHNS, M.I.Mech.E. (Swansea), supported the vote, and expressed his appreciation of their invitation to be present, and for the opportunity of seeing the plant in use.

Mr. A. E. PARK and Mr. F. STEWART JOHNS (Swansea) also expressed their appreciation of the Address, and the hospitality of the Gas Department, and Mr. E. M. EDWARDS, Engineer and Manager of the Port Talbot Gas Department, was happy to know that they found the visit of interest and perhaps some profit. He wished to acknowledge his indebtedness to the whole of his staff for the way they were supporting him. He would like to say in reply to Mr. Cuniffe that after seven years' use the plant was in excellent condition. The repairs cost was not high and would not be high even when it came to resetting.

A Technical Signpost to the "JOURNAL"

Covering items of outstanding technical interest during the October-December quarter of 1934.

Vol. 208, October to December, 1934.

GENERAL.

In a recent Presidential Address to the Coke Oven Managers' Association it is suggested that the coke oven industry should consider alternative and more profitable methods of disposal of their surplus gas than by sale to Gas Undertakings (p. 428). Attention is drawn to the potentialities of coke oven gas as a raw material in the manufacture of various chemicals such as methanol, and for hydrogenation, &c.

An interesting description has been published of an automatic coal and coke handling plant at Zurich which was visited by the delegates to the International Gas Conference in September last (p. 155). A truck, in which the coal is elevated up an inclined plane, rests on springs, the depression of which actuates the hoisting motor when a certain weight of coal has been charged. When nearing the top of the inclined track the speed of the truck is automatically checked so that it is brought to rest without undue shock. The contents are then automatically discharged into a receiving hopper. As the truck descends, the hopper is caused to traverse over the top of the ovens where its contents are automatically discharged in equal quantities into small hoppers holding the charge for each oven. For this purpose the travelling hopper is provided with a rotary discharge valve. The capacity of the plant is 120 tons per hour and the coal is elevated through a height of 100 ft.

Another coal handling plant which has recently been constructed is that of the Wandsworth Gas Company (p. 558).

It is pointed out in a recent German paper that the presence of coal gas is easily detected by its odour before the concentration is sufficiently high for its carbon monoxide content to attain toxic proportions (p. 892). Thus a concentration of 100 volumes per million of air, which is noticeable by its smell, may be tolerated for several hours without ill effects. Fatal results only ensue when some 80% of the hæmoglobin has been converted to the carbon monoxide compound.

CARBONIZATION.

A comprehensive paper has been given by Richards on the cost of gas production in continuous vertical retorts and in intermittent chamber ovens (p. 339). As Chairman of the Woodall-Duckham Companies, the author is obviously in a position to give an accurate and thoroughly representative comparison between these two methods of carbonization, although it must be appreciated that the costs in individual cases may differ appreciably from any average figures. A useful generalization is advanced in regard to the manufacture of a gas with a calorific value of 500 B.Th.U. per c.ft. in continuous vertical retorts and the following figures represent modifications in practice which have equal monetary value—*i.e.*:

25% increase in fuel consumption.
72% increase in labour.
26% increase in capital expended.
$\frac{3}{4}$d. per gallon decrease in value of tar.
11d. per ton decrease in value of coke sold.

In comparing the above two types of plant, a unit of 15,000 therms per day is taken, while full details of capital, labour, and other charges are given. In regard to continuous vertical retorts, the cost of manufacture is examined in relation to different working conditions. Thus a variation in calorific value has little effect on the cost over a limited range—*i.e.*:

Calorific Value.	Cost per Therm.	Relative Output of Therms.
B.Th.U. per C.Ft.	Pence.	
520	1·755	94·5
500	1·688	100
475	1·659	100
450	1·614	100

The thermal output is also fairly constant, although the throughput of coal decreases with the calorific value. The lower output of therms at 520 B.Th.U. per c.ft. should be noted and the correspondingly higher cost—viz., 1·755d. While the lower quality gas is more cheaply produced it is not unlikely that extra purification, storage, &c., charges incurred by the increased volume of gas to be handled may more than off-set the lower retort house costs. The effect of variation in coal throughout at a constant calorific value (*i.e.*, 500 B.Th.U.) is generally appreciated:

Coal—Tons per inch major axis per day.	0·104	0·098	0·092
Therms per ton	80	81	82
Therms per inch major axis per day	8·32	7·94	7·54
Cost per therm (pence)	1·688	1·704	1·721

The higher yield per ton is secured by an increased expenditure and is thus less economical than the lower thermal yield and greater throughput. The surplus steam generated by the waste gases is not appreciably affected by variations in calorific value over the range 450-500 B.Th.U. per c.ft. The practice of using breeze or small coke as producer fuel has been found to be definitely economical; with a Yorkshire coal 45% of fuel under $\frac{5}{8}$ in. can be used in the producers. Against the reduced cost of fuel, there must, however, be debited the increased labour in clinkering, increased steam consumption, and larger grate areas required. The net result is given as:

Calorific value of gas (B.Th U per c.ft.)	500	500
Type of fuel used	Coke	Breeze
Total cost per therm (pence)	1·688	1·627

In the case of the intermittent chamber oven the cheapest gas is made at a calorific value of about 520 B.Th.U. per c.ft.—viz.:

Calorific value (B.Th.U. per c ft.)	450	520	550
Cost per therm (pence)	1·997	1·909	1·924

The thermal output decreases as the calorific value is reduced by heavier steaming, this being attributed to the inefficient decomposition of the steam admitted at the end of the carbonizing period. The fuel consumption is always greater than with the continuous vertical retort, mainly due to the heat lost in the discharge of the hot coke. The fuel consumption increases as the calorific value is reduced. In comparison with the continuous vertical retort labour costs are, in general, lower and capital costs higher with the intermittent chamber oven. The over-all cost per therm is slightly greater in the case of the intermittent chamber oven—viz.:

—	S. Yorks Coal.	Durham Coal.
Intermittent vertical chamber oven	1·929	1·879
Continuous vertical retort	1·688	1·797

It will be noted, however, that the difference between the two systems is much reduced when using Durham coal.

The relationship between the cost of coal gas and water gas for base and peak loads is treated on the basis of an article previously contributed by Messrs. Humphreys & Glasgow ("JOURNAL" for Aug. 23, 1933).

Some exception is taken to their conclusions and re-calculations are made to show that the difference in cost is considerably less than was indicated in the original article, and that with the extra duty of 1d. per gallon on oil, little or no advantage is secured by increasing the proportion of carburetted water gas. The basic data and methods of computation taken in each case differ considerably and indicate the difficulty of making general statements of this nature.

Interesting costs have been published in relation to the carbonizing practice at Walsall (p. 893). The actual yields, &c., are based on tests, each of several weeks' duration, and allow comparisons to be made between continuous vertical retorts and horizontal retorts *plus* water gas

plant. The costs of production of a gas of 450 B.Th.U. per c.ft. are:

Continuous vertical retorts	1·90d. per therm
Horizontal retorts *plus* blue water gas	2·70d. ,,

The cost of manufacture of blue water gas is given as about 3·3d. per therm. Investigation of the above costs revealed that the majority of the difference is accounted for in cost of plant up-keep and labour.

It will be noted that the cost of manufacture in the continuous vertical retort (*i.e.*, 1·9d. per therm) is appreciably higher than that given by Richards for gas of the same calorific value.

Details have been given concerning the use of breeze in Glover-West producers at Kilmarnock when gasifying the fuel at the rate of about 10 lbs. per sq. ft. of grate area per hour (p. 897). In normal working it is possible to use fuel of the following grading:

Under 1½ in. over 1 in.	30%
,, 1 ,, ,, ½ ,,	29 ,,
,, ½ ,, ,, ⅛ ,,	41 ,,

The fires are cleaned once per day, but are pricked up at interval of 12 hours. The combustible matter in the clinker is given as about 25%, and over a period of 12 months the fuel consumption averaged 17·5% of the coal carbonized.

Some of the difficulties encountered in comparing tests of different carbonizing plants are discussed by Foxwell (p. 750). In the first place there are no laboratory tests by which the thermal yield of any coal for any type of retort may be determined. There are obvious difficulties in the reproduction in the laboratory of conditions in a continuous vertical retort, but this problem should not prove insuperable. The fuel consumption of any plant is dependent upon the composition of the fuel—in particular the moisture content—which may vary appreciably in different consignments of a coal. The increase in fuel consumption incurred by higher moisture content is obviously largely determined by the extent to which this moisture is converted into water gas. No simple correction is admissible.

It is suggested by a Continental investigator that in assessing coal for carbonization purposes the oxygen content should be classed as an impurity (p. 619). The thermal value of the volatile matter decreases as the oxygen increases, while the volume of gas does not increase proportionally to the volatile content due to greater formation of water.

There have been several attempts to carbonize coal in electrically heated retorts, using cheap off-peak current, but for various reasons none appears to have progressed very far. Experiments were made by the Detroit Edison Company in 1931, which, although the results were technically satisfactory, were discontinued as uneconomic owing to the competition of natural gas. In 1933 an experimental plant was erected at Baden in Switzerland (p. 561). This consisted of a retort lined with firebrick with a central core of coke, which was initially enclosed in a paper cylinder. This core was coupled to the power supply and acted as an electrode. Subsequently the coke cylinder was replaced by a metal spiral. It was found that a charge of coal could be carbonized in 10 hours yielding 70·5 therms per ton, with a current consumption of 795 KW.-H. per ton of coal. It is estimated that if the cost of the process is not to exceed that of producer gas heating (coke at 20s. per ton), electric current must be available at 0·07d. per unit.

In the annual report of Low Temperature Carbonisation, Ltd., who are this year paying a dividend of 3% on their shares, it is stated that extensions and new works under erection will raise the annual tonnage of coal carbonized to some 560,000 tons (p. 901). During the year 9 home defence squadrons have been flying on coal petrol made in the Coalite process. Some details of the present-day plant used in the Coalite process are given in a recent Paper by Bristow, from which it is noted that there are now three Coalite plants in operation and that two further plants are to be constructed (p. 816).

Despite the fate of so many low-temperature carbonization processes, new ones still appear. In the latest process—that of the National Coke and Oil Company—the objective appears to be the production of light spirit suitable for internal combustion engines (p. 264). A mixture of coal and creosote is carbonized in an inclined rotary retort which is heated externally to a temperature of 450° C. The oil is condensed from the gas and distilled, the heavy fraction being returned for mixture with the next batch of coal. A test has been carried out on the process under the supervision of Dr. Lander and has yielded some remarkable results. From a mixture of 2,710 gallons of creosote and 143·9 tons of coal, a yield of 2,192 gallons of "petrol" was obtained and 15·6 cwt. of low-temperature fuel per ton of coal, while a volume of 635 gallons of heavy oil remained for recirculation. The yield of "petrol" is equivalent to 15·3 gallons per ton of coal, which is considerably in excess of the normal yield obtained by low-temperature carbonization. In what way the greater yield is attributable to the presence of the creosote or whether it is to be regarded as a product of the cracking of the creosote is not clear, and further information regarding this process will be awaited with interest.

WATER GAS.

Continuing their work on water gas plants, the research staff of the Institution have now carried out a series of tests on a Humphreys & Glasgow carburetted water gas plant to determine the influence of various factors on the cost and efficiency of manufacture (p. 361). On any particular plant operated under given conditions, the cost of raw materials per therm of carburetted water gas is dependent upon the output of gas. In circumstances which do not demand the highest output, the cost of raw materials can be considerably reduced. The choice of operating conditions is always limited by the necessity of having sufficient heat in the blow gases for oil cracking and steam raising. Inefficient mixing of the blow gases and secondary air in the carburettor necessitates extra heat being supplied from the generator. By the use of a "creeper" valve giving a variable admission of secondary air, the degree of combustion of the blow gases can be improved and the consumption of coke reduced. With regard to the size of the coke used it is found that with large coke, a higher thermal yield per 1,000 lbs. of coke and a greater throughput is obtained. Smaller grades of coke can, however, be used without technical difficulty and allow some economy if their value is sufficiently low to compensate for the increased consumption entailed. The rate of rotation of the grate, if unduly increased, tends to reduce the proportion of steam which may be added on the backrun, and also increases the percentage of combustible matter in the clinker. The provision of a generator boiler affords an extra supply of steam but at the cost of increased coke consumption. It is estimated that the removal of the boiler would increase the cost of manufacture unless the extra steam required could be supplied at a cost of about 1s. 1d. per ton.

REFRACTORY MATERIALS.

Considerable interest has been taken in the new laboratories which have been established at Stoke-on-Trent by the British Refractories Research Association, as the new "Mellor Laboratory" represents the first independent research institution whose activities are solely devoted to investigation and research in the refractory and clay industries (p. 812). Among other equipment in the new premises note is made of a 50-ton Avery Universal testing machine, which has been adapted for testing the transverse strength of refractory bars, 2 in. square and with a span of 7 in., and also of full-size bricks.

In the recent report of the Refractories Committee of the Institution there is summarized the results of a questionnaire issued to gas undertakings regarding their experiences of refractory materials (p. 357). While experience and opinion vary considerably the replies have shown certain general tendencies the appreciation of which is of considerable importance. The various questions are considered under their respective headings.

Life of Settings.

The life of horizontal retorts varies from 1,000 to 2,500 days, a general average being 1,700 days. In many works, however, 2,000 days is quite a normal practice. There is no indication of definite correlation between life of retorts and working temperatures. In general a greater life is being obtained with segmental silica retorts than with other types, despite the fact that higher temperatures are often worked with silica retorts. In regard to vertical retorts, a rather greater variation in useful life is reported—*i.e.*, from 1,000 to well over 3,000 days—dependent largely upon the extent of the intervening repairs.

Cause of Failure of Retorts.

There is little unanimity in the case of horizontal retorts, failure being variously attributed to abrasion by discharge of coke, faulty joints and jointing material, slagging by flue dust, &c. Failure of vertical retorts is largely due to localized defects—*i.e.*, spalling and flaking in a zone about 6 ft.-12 ft. below the top of the retort and failure of the bottom courses due to slagging and fluxing by the ash liberated from the coke.

Effect of Scurfing.

With horizontal retorts this does not appear to be regarded as a serious contributor to retort failure, but in vertical retorts the effects may be more serious.

Influence of Type of Coal Carbonized.

The nature of the coal would appear to have little effect on the life of horizontal retorts except as regards the fluxing

properties of the ash entrained by the producer gas. With vertical retorts irregular heating often accompanies the use of unsuitable coals which hang up in the retort, and the composition of the ash is a factor in the life of the refractories at the base of the retort. While it is the general opinion that steaming does not affect the refractory material, there is a definite minority who consider that it contributes to the deterioration of the lower zone of brickwork.

Repair Work.

In the case of horizontal retorts hot patching is fairly generally employed, with cold patching when retorts are let down for repairs. Hot patching is generally carried out with vertical retorts after scurfing, but the results are not always satisfactory and the process has usually to be repeated after every scurfing. Attempts are made to resurface areas where spalling has taken place, but this is a difficult operation and again satisfactory results are not general. Failure of the brickwork due to stresses incurred in heating up new and repaired work is rarely encountered in either horizontal or vertical retorts.

Experimental work has been continued by the Association on the formulation of a standard test for refractoriness under load. The tests used in America and Germany are compared and some of the factors which require standardization in the operation of the test are discussed. Further investigation of the attack of alkali fluxes on brickwork is also reported.

PURIFICATION.

During the past year a questionnaire was sent by the Ammonia Committee of the Institution to all undertakings asking for various particulars concerning their method of treatment or disposal of ammoniacal liquor (p. 354). Replies were received from only 55% of these, but they represented 80% of the total coal carbonized. The replies are summarized as follows:

		%
1.	Undertakings manufacturing sulphate of ammonia	56·2
2.	,, ,, concentrated gas liquor	10·7
3.	,, disposing of liquor to chemical works.	17·1
4.	,, ,, ,, crude liquor, *via* sewage and other means	16·0

The majority of the sulphate of ammonia is being produced at the large or medium-sized works, and many works carbonizing less than 20,000 tons per annum do not attempt ammonia recovery. On the other hand, the manufacture of concentrated gas liquor is most popular with works carbonizing from 20,000 to 50,000 tons of coal per annum. The recovery of fixed ammonia appears to be generally practised where sulphate of ammonia is being made, but not in the manufacture of concentrated gas liquor. While the most generally adopted method for the disposal of the crude liquor is *via* the sewage system, there are cases where less desirable methods are employed. As greater attention is now being paid in many districts to the question of water pollution, disposal of liquor other than by authorized methods will doubtless become correspondingly difficult.

Further work has been carried out by the Committee on the disposal of gas liquor and effluent liquor in sewage systems. The effect of the liquor on the oxygen absorption value of the sewage may be calculated from the composition of the liquor, and the additional biochemical oxygen required is proportional to the increase in the oxygen absorption value. Generally, however, this increase is only a small fraction of the total requirement of biochemical oxygen and should not materially influence the working of a sewage system.

Investigation work on the formation of gum deposits in town gas is still being continued in America (p. 677). An accurate and reliable test for the nitric oxide present in gas is an essential preliminary to satisfactory removal of this constituent, and considerable work has been devoted to this end. It is found that the oxidation of traces of nitric oxide to nitrogen peroxide is accelerated by certain unsaturated hydrocarbons such as butadiene. The resulting nitrogen peroxide then combines with the unsaturated compounds to form gums. Consequently a test for nitric oxide may yield low results when this compound is being rapidly oxidized, and it would appear that a satisfactory method of determining nitric oxide has not yet been obtained. On the other hand, its rapid oxidation and the subsequent gum formation prove advantageous, in that the gum is then formed in the works mains and holders rather than in appliances on the district. Removal of the nitric oxide in the oxide purifiers is still regarded as the most efficient method of extraction, the modification in working of the boxes involving an extra cost of some 0·15 cent per 1,000 c.ft. The reduction of this impurity down to 15 grains per million c.ft. which has now been practised for some time at one works has not eliminated gum troubles, and an even greater degree of purification is contemplated. As regards the modification of appliances to prevent gum stoppage, the passage of gas through filters fitted to each appliance has given encouraging results, and this is regarded as the only suitable treatment where works are unable to remove the nitric oxide in their oxide purification plant.

The manufacture of "Tetranap"—tetrahydronaphthalene—a liquid product obtained by the hydrogenation of naphthalene, is now practised in this country by the I.C.I. (p. 740). This compound is an excellent solvent for naphthalene and has been employed on the Continent for some time both as a wash oil and for spraying into mains with the gas. In regard to the latter use, the vapour pressure of Tetranap is such that sufficient volume will condense for any fall in temperature to dissolve the naphthalene deposited under the same conditions. The fact that gas is frequently supersaturated with naphthalene, however, reduces the reliability of this otherwise simple method.

TAR AND BENZOLE.

The work on hydrogenation of tar and tar oils which has been in progress for several years at the Fuel Research Station has been summarized by the Director of Fuel Research (p. 433). After preliminary work on several small (laboratory scale) units a plant capable of treating 300 gallons per day is being constructed, and the results from this plant should then afford a more reliable indication of the commercial possibilities of the hydrogenation of various tars and tar oils. With regard to the work which has been carried out with the small units, it has been established that yields of over 40% of spirit boiling below 200° C. can be obtained from crude low-temperature tars. The most efficient catalysts so far examined are the halogens and the sulphides of molybdenum and tungsten. These catalysts give the highest yields when deposited on a suitable carrier such as active carbon or silica gel. The activity of the catalyst falls progressively, but can be restored to its initial value by passing air through it at 500° C. The life of the catalyst varies, according to the conditions, from 10 to 40 days before regeneration is necessary. The yields from high-temperature tar are considerably lower than from the low-temperature product; thus treatment of a tar from Glover-West continuous vertical retorts yielded 23-27% of light oil. By treatment of the creosote oil fraction, however, this increased to 49·9%. The possibility of refining crude benzole by hydrogenation is also being examined. Promising results are being obtained, and it is found, *inter alia*, that a gas containing only 65% of hydrogen may be used. This would very considerably reduce the cost of any process to which it could be applied.

It is noted from the recently published Board of Trade returns for 1933 that the total production of refined benzole from gas-works was 6½ million gallons, which may be compared with the total production of 48 million gallons of crude benzole from all sources (p. 49).

According to a German investigator, an efficient rectification of crude benzole can be obtained by treatment with Fuller's-earth (p. 611). The spirit is refluxed in contact with the Fuller's-earth, the mixture being kept continuously agitated. When using from 4·5% to 9·0% of earth, the loss on refining varied from 5% to 8%. The treatment is said to remove the free H_2S, organic sulphur, and some of the gum-forming constituents, and gumming tests on the refined spirit gave a yield of 10 milligrammes of gum per 100 c.c. of spirit.

COKE.

The work previously carried out at the University of Leeds on the reactivity of coke has been extended to an examination of this property at the higher temperatures such as are encountered in various processes in which the combustion of coke is utilized (p. 351). It has often been suggested that the differences in reactivity found at lower temperatures would disappear at these higher temperatures—*i.e.*, 900°-1,500° C. since the velocity of the reactions would be so greatly increased. Experiments have now shown, however, that although the reactivity is increased about a hundredfold, it is still possible to distinguish between different types of carbon, and that the differences obtained are of the same order as those found at lower temperatures. The reactivity was measured by the percentage carbon dioxide reduced to carbon monoxide in unit time, and it was found that in order to determine differences in reactivity the time of contact must be reduced accordingly to the reaction temperature—otherwise complete reduction of the carbon dioxide occurred with all the materials examined. Thus at 1,250° C., the time of contact must not exceed 1 second and at 1,500° C. 1-10th second. At 1,200°

C. the following values were obtained with a time of contact of 1 second:

Coconut charcoal	100
Coke from New Hucknall coal	83
,, ,, Holmside coal	42
Ceylon graphite	30

The practical application of these results is discussed.

A booklet has been published by the South Metropolitan Gas Company in which are summarized the results of investigation work carried out over a number of years in the solid products of carbonization (p. 333). Much of the subject-matter relates to that Company's methods of determining ignition temperature, reactivity, &c., of various types of coke. With regard to ignition temperature, this is found to bear a fairly definite relation to the hydrogen content of a coke. Comparison of laboratory combustibility and ignition tests with the behaviour of coke in an open grate led to the conclusion that "the behaviour of a fuel in a grate as regards ease of ignition was proportional to the square of the combustible matter index." Another method of examining coke is by its action on sulphuric acid as indicated by the quantity of sulphur dioxide evolved at a given temperature. There is a definite relationship between this value and the carbonization temperature, and it is considered that the test is truly indicative of the chemical nature of the material rather than of the physical structure which probably influences the results of reactivity and other tests. Attempts were made on both a laboratory and works scale to improve the rate of combustion by alteration of the physical structure of cokes, but in no case was any substantial improvement secured. In agreement with previous workers it is concluded that there is a definite change in the chemical nature of the material at about 700° C., and that this temperature must be regarded as the upper limit for a coke suitable for the ordinary domestic grate.

With regard to the use of high-temperature coke, the development of the well-known "Metro" grate is described and the methods used for testing the behaviour of coke in this appliance. In discussing the influence of ash, moisture, &c., on the combustion of different cokes, it is stated that the behaviour of the ash is of more consequence than its weight, fusibility, &c. A finely divided voluminous ash coats the particles of coke, reducing the access of air to the surface and rate of combustion. Ease of ignition is mainly dependent on the volatile therm content of the coke, and for coke to give satisfaction to users a minimum volatile therm content of 2·5 therms per ton is essential.

High-temperature coke is also examined with regard to combustion in domestic boilers. Tests for the minimum rate of combustion suitable for such boilers showed that the volatile thermal content should not be less than 2·5 therms per ton. The quantity and nature of the ash are again important factors. By carbonizing a low ash coal so as to leave 4 therms per ton in the coke it has been possible to produce a coke suitable for the most exacting conditions.

Gas Regulation Acts

Application by Salisbury Gas Company for Special Order

The Salisbury Gas Company is proposing to extend its limits of supply and to purchase the Wilton Corporation's Gas Undertaking, and on Monday, March 11, Mr. J. F. Ronca (Director of Gas Administration) held an inquiry in London concerning an application by the Company for a Special Order for this purpose under the Gas Regulation Acts. The Company was represented by Mr. A. E. Carr, of Messrs. Kennedy & Co. (Parliamentary Agents), and he was supported by Mr. W. Fielden, the Managing Director and Engineer to the Company, as well as by Mr. W. G. Vizard, the Solicitor. The only opponent was the Wiltshire County Council, which was represented by Mr. W. Leonard Hey, Assistant Solicitor to the County Council.

Mr. CARR, for the Salisbury Gas Company, said that under the agreement which was scheduled to the Order it was agreed that the purchase price of the Wilton Undertaking should be £3,000, the transfer to take place as from April 1, 1935, if this Special Order was granted by then or at the end of one month from the approval of the Order by Parliament. The Company was already extending its mains to give a supply in Wilton from its present works, but it would not be in the position to lay mains in Wilton until the Order was sanctioned by Parliament.

Continuing, it was pointed out that the Order also asks for an extension of the limits of supply to include certain additional parishes in the County of Wiltshire.

Coming to the objections to the Order, it was stated that although the proposals affected seven different local authorities in the area, only the Wiltshire County Council appeared in opposition, and the point in dispute was as to the protection afforded by the Order to the County Council as the authority for the main roads and bridges in the county. The Order, however, incorporated the Gasworks Clauses Act of 1847, which dealt with this matter and constituted the general law on the subject, but the Wiltshire County Council required further protection, which, in any case, could only apply to the extended area of supply under this Order. So far as the present area of supply was concerned, the provisions of the Gasworks Clauses Act now applied, and therefore, assuming further protection was granted by the Board of Trade, there would be the position that different legislation on this question of repair and maintenance of roads by the County Council would apply in different parts of the gas supply area. The promoters, however, objected to any such proposition, and held the view that if the Wiltshire County Council wished to get such extra protection it should either proceed to secure an alteration in the general law by way of a Private Member's Bill in Parliament or endeavour to induce the Board of Trade to bring forward a proposal of that nature.

As a matter of fact, the County Council had submitted to the promoters a very lengthy clause which it was suggested should be substituted for Clauses 6 to 12 of the Gasworks Clauses Act of 1847, and he understood that this clause had been drafted some years ago by the County Councils Association for application to legislation regarding the laying of gas pipes and electricity mains. Nevertheless, he knew of no precedent for the compulsory insertion of this clause in any Act of Parliament or Order relating either to gas or electricity. It was not unusual for County Councils to come forward with proposals of this nature to vary the general law, but although agreements were sometimes come to in regard to them, actually the last contested case was the Northampton Gas Order of 1925, in which the circumstances were very similar to those in the present case—viz., certain parts of the area of supply were under the general law and the County Council asked for further powers in regard to a proposed extension of the limits of supply. In connection with that Order, Mr. Honey—who was then the Director of Gas Administration—laid down very clearly what he said was the view of the Board of Trade on the question of varying the general law in particular Orders. Mr. Honey had said that, in the absence of agreement between the parties, it was not the practice of the Board of Trade to recommend Parliament to make modifications of the general law in favour of any authority which had to maintain, repair, and improve the roads as against public utility undertakings which had the right to break up the roads, under certain conditions, for the laying of pipes or cables.

Continuing, Mr. Carr said the Board of Trade refused to insert a special clause in the Northampton Order in favour of the Northamptonshire County Council, and although the issue was subsequently fought out before a Select Committee of the House of Lords, of which the Chairman was the Marquis of Bath, the Northamptonshire County Council was again unsuccessful. It was agreed, however, during those Committee proceedings that the provision in the general law for three days' notice should be altered to fourteen days' notice, and in the present case the Salisbury Company was willing to agree to such a modification.

Mr. W. LEONARD HEY, for the Wiltshire County Council, said the County Council had lodged this petition with a view to getting more adequate protection as regards its roads than it possessed under the Gasworks Clauses Act of 1847. The construction of main county roads had changed very considerably since the Act of 1847 was passed, and the whole position had been investigated by a Committee consisting of representatives of the County Councils Association, gas undertakings, electricity undertakings, and water undertakings. That inquiry had started a few years ago and the proceedings had been very protracted owing to the careful manner in which they had been carried out, but the result was, according to his information, that on July 25 of last year, the Committee had recommended a form of clause which should be inserted in all legislation affecting public utility undertakings and roads, in the future.

The DIRECTOR asked if the County Councils Association and the public utility authorities mentioned had a General Act in view, dealing with this matter.

Mr. HEY replied that this particular clause—of which a copy had been sent to the promoters in the present case—was not, in fact, a clause which the County Council itself would have put forward had it not, through the County Councils Association, taken part in the deliberations and agreed to it. Actually, the clause as put forward by the Joint Committee did not go as far as the Wiltshire County Council would desire, although it helped County Councils to some extent. His Council would have liked the clause to have gone further, for instance, in regard to reinstatements, so that the gas undertakings should

be responsible for any injury that might arise through the reinstatement.

The DIRECTOR said he gathered that this matter had been discussed with the National Gas Council.

Mr. CARR remarked that the Salisbury Gas Company was not a member of the National Gas Council.

Mr. HEY, continuing, pointed out that the Swindon Gas Company had recently obtained a Special Order and had entered into a supplemental agreement with the Wiltshire County Council, outside the Order, to abide by this clause for a period of years; and if, in the meantime, there was any modification of it which was generally accepted, then the Swindon Gas Company would abide by any such modification.

The DIRECTOR suggested that this rather looked as if the clause which had been placed before him had not yet been agreed.

Mr. HEY said it had been agreed by the Joint Committee, although not by the main bodies to which this Joint Committee reported.

Mr. CARR replied that that was not his information. As a matter of fact he had a letter from the National Gas Council stating that the clause proposed by the Wiltshire County Council was very different from the one prepared by the Joint Committee.

Mr. HEY retorted that he had been told by the Secretary of the County Councils Association last week that not only was the Joint Committee in agreement, but the National Gas Council was pressing the County Councils Association to get it put into future Orders.

The DIRECTOR suggested that there apparently had not been agreement inasmuch as the Swindon Gas Company had entered into an agreement outside the terms of their Order. Moreover, the Swindon Company had agreed to accept any modification that might be come to between the County Councils and public utility authorities, which again suggested that final agreement had not been reached.

Mr. HEY said undoubtedly the Joint Committee was in agreement, but he could not say that the County Councils Association or the organizations representing gas, electricity, and water had approved the clause. He continued that in addition to Swindon, the Bath Gas Company had accepted a clause of a similar nature, but in a somewhat modified form, and if the County Council had not lodged an objection in the present case it would have been breaking faith with these two companies.

Finally, Mr. HEY asked that the present Order should be made a little clearer on one or two small points, and he specially asked that in the case of bridges, the Gas Company should carry out the work to the satisfaction of the County Council, and that gas mains should be laid outside and not inside the roads of such bridges, the County Council having the right of approval.

Mr. CARR, in a few final comments, emphasized the existence of the general law and the undesirability of modifying it in particular cases, and also the undesirability of having one code applying to one part of the Company's area and another code applying to another part, which could only lead to confusion.

The DIRECTOR said he would report to the Board of Trade in due course.

Brighton, Hove, and Worthing Gas Company

Ordinary General Meeting

The ANNUAL ORDINARY GENERAL MEETING of the Brighton, Hove, and Worthing Gas Company was held on March 1 at the Company's Offices, 5, Great Winchester Street, London, E.C.

Mr. A. M. PADDON, M.Inst.C.E. (the Chairman of the Company), presided.

The SECRETARY (Mr. Hyde C. Burton, F.C.A.) having read the notice convening the meeting, and the report and accounts taken as read,

The CHAIRMAN said: Gentlemen,—The Directors' report tells you that "despite the provisions of the Company's Act of 1934 (prohibiting housing authorities from imposing conditions designed to limit the use of gas in municipal houses) the company have been as yet unable to obtain general facilities for the supply of gas to certain municipally provided dwellings." Now, gentlemen, the genesis of this matter was the construction by the Brighton Corporation as a housing authority of a large number of houses. I may say that the demand for this accommodation was of an extremely urgent kind, so that the prospective tenants were in the position of having to accept, by sheer stress of circumstances, whatever might be afforded them by such building operations. They had to take what was given them. The Brighton Corporation are the traders and suppliers of electricity, and they proceeded to make these buildings "all-electric" from top to bottom, filling the whole dwelling with the electrical apparatus for which they would in future supply the necessary current.

Results of Corporation's Action.

Now three results eventuated. The first was a truncation and an abrogation of the company's statutory rights, because our Parliamentary powers authorize us to offer our commodity—gas—to all occupiers within the area as defined by our Act. It is perfectly obvious that if the houses were to be so constructed and provided that it was a physical impossibility to use gas, there was, as a consequence, a truncation of our statutory powers. The next thing that supervened was the deprivation of the tenant's right to decide what he should use in his own house. Now that is a right that attaches to the ordinary householder everywhere—that he should, at least, be allowed within the house he occupies to decide what he will use for light, heat, and other domestic purposes. This he is absolutely precluded from doing by the action of the Brighton Corporation, who have left him no choice in the matter but to adopt the exclusive use of electricity for all his requirements. It appears to me as a *prima facie* aspect that the municipal tenant has become a municipal serf—and I am talking about Brighton, not Russia.

The third consequence was that the revenue from the use of electricity would be arbitrarily appropriated to the electrical undertaking, and thus they would secure, by the enforcement of their regulations, that that revenue must come into their coffers—it could not go anywhere else. That, gentlemen, is rather an arbitrary action on the part of a trader, whether municipal or otherwise.

Appeal to Parliament.

Now we regarded this action of the Brighton Corporation as a gross abuse of the powers confided to them as a public and housing authority, and we appealed to Parliament to redress the wrong. We were not peculiar in that position, because the same situation had arisen in various parts of the country. We applied to Parliament to arrest that action and to restore to the tenant his liberties within his own house and to us a reasonable construction of our statutory rights.

The treatment of this matter by Parliament was rather exceptional. Usually, when a measure of this kind is introduced, dealing with local matters (generally referred to as "private legislation"), the question is remitted to a Committee of the House to deal with, the action of which Committee is subsequently endorsed by the full House. It is unusual that the House itself, in full session, should give its attention to such matters as these. But in this case, the principle for which we contended, the very terminology of what we sought, had been raised in the full House on two occasions and debated by the full House, with the result that our contentions and our submissions, in common with that of others, were overwhelmingly confirmed in full debate. Thus the policy and the action I have described to you as emanating from the Brighton Corporation were reprehended by the House of Commons.

When we got to the Committee stage and were to be heard in support of our own application, we were bitterly opposed by the Brighton Corporation. There are 12 municipalities or local authorities in our area, and only two out of the 12—Portslade associated themselves with Brighton—opposed us. A very extensive hearing was given by the Committee to our case and to the case of the Brighton Corporation, with exactly the same result as attended the debate in the full House—that they passed our Bill without crossing a "t" or dotting an "i," giving us the whole Bill exactly as we asked for it. The intention of the decision of Parliament in this matter is absolutely clear—it is to give the tenant free choice as to what he shall use for lighting, heating, and power in his own house.

The Company's Act.

The actual wording of the Act is very short. It says: "The Housing Authority shall not in connexion with the selling, leasing, letting, or disposal of any land, make or impose any condition or restriction in respect to the form of light, heat, power, or energy to be supplied to or used in any such building on any such land or in any building erected on such land."

Now any child or any honest man could plainly see from that what was the intention of Parliament. It is, as I say, to confer freedom of choice upon the occupier of any premises and to establish clearly that just because he is a municipal tenant he should not sacrifice his ordinary rights as a citizen.

When Parliament has expressed in a clear manner its purpose and its policy in regard to any matter upon which its pronouncement has been sought, it is incumbent upon those to whom its enactments apply, whether a private individual or a public body, loyally to implement and carry out the purpose disclosed by the Act of Parliament. And all the other local authorities, so far as I am aware, throughout the country have accepted it in that way.

In addition to passing this private Act in our particular favour, almost immediately afterwards a public Act was passed by the Government applying the principle of free choice for the tenant to all municipalities throughout the land, including of course the Metropolitan area. I happen to be responsibly connected with large portions of that, and I can assure you that the local authorities who, up to that time, had been providing municipal buildings with electricity exclusively have

since loyally cooperated with the gas companies in the operation of the Act and have allowed us facilities for providing to each tenant an opportunity of choosing between gas or electricity as he may please. The only instance to the contrary that I know of is the Brighton Corporation.

The Practical Interpretation of the Act.

Now, gentlemen, however carefully an Act of Parliament may be drawn—and I have been responsible for drafting some private Acts—it is always possible by deliberate intention, by disingenuous treatment, or through ambiguity in terminology to pervert its object.

The only possible practical interpretation and application of this Act is the one given to it all over the country, whether by builders or local authorities—namely, that at the time the municipal dwelling is in course of construction equal facilities should be given to the electrical undertakers and to the gas undertakers to prepare the dwelling so that the ultimate tenant should have a choice between the commodities.

Evidence Before Parliamentary Committee.

When we were before the Committee we adduced evidence to show what was the normal, orthodox way of providing houses of this description and constructing them, and builders responsible for very large expenditure on operations in this way gave evidence in support. This is what one of them, Mr. Braybon, said:—

Counsel put to him: "Out of that total of 1,900 houses for which you have been responsible, could you tell the Committee how many are all-electric?" He said: "Eighty-one." "And the remaining 1,820 all provide for the use of gas?" "Yes." The Chairman: "They are not exclusively gas, are they?" "No; most of them use gas for cooking, and perhaps heating, and electricity for lighting." Mr. Askew: "Putting it quite shortly, in your experience in building these houses and selling them, do you think gas is necessary?" "I do." "Would you be able to sell them if you were not able to provide for a gas supply?" "I would not say I would not be able to sell them, but people, I think, have a preference for gas, seeing the demand there is for the gas house." That is the situation with which the Brighton Corporation were confronted in providing accommodation for these poor people.

We called another witness, Mr. Leo Henry Paul Meyer, and he was examined. Counsel said to him: "Where have your activities chiefly been?" "Mainly around London." "About how many houses have you erected since 1926?" "Somewhere in the neighbourhood of 18,000." "Are practically all those houses speculative houses?" "No, 12,000 are speculative houses; 6,000 were contract houses for municipal authorities." "Did the Reliance Electrical Company, of which you told us you were the managing director, carry out the electrical installation in these houses?" "In the whole of the speculative houses, yes." "What has your experience been as regards the demands of the people who are going to take these houses, for gas and electricity?" "Taking last year's figures, I built last year 5,000 houses (mainly around London that was), and including Hastings, and I have the precise figures of the results, if I can refer to them. I built just over 5,000 houses, and the number of houses in which gas was used for lighting, heating, and cooking—that is to say, with no electricity at all—was approximately—that is, within one or two each way—220; that is all gas complete, with no electricity. The number of houses where electric light was installed for lighting and gas in conjunction with electricity for heating and gas solely for cooking was 4,750 approximately. The number of houses where electricity was installed for lighting, heating, and cooking, with no gas, was 50." "That is all-electric?" "Yes, all-electric." "So that out of 5,000, 4,750 had electric lighting and gas for cooking and gas or electricity for heating?" "That is right." The Chairman.—"What type of houses were these?" "These houses range from £395 selling price to £900." That amply covers the type of house provided for the municipal tenant.

He was asked: "What size would those smallest houses be—the £395 houses?" "Three bedrooms, living room, a combined kitchen and dining-room, and a bathroom." "With your experience, if you had to make your houses 'all-electric,' would you be able to dispose of them?" "Instead of my selling 5,000 a year I would sell about 100 or so. That is my considered opinion." "Where are these 'all-electric' houses; are they all in one area?" "No, they are dotted about." "There are only about 50 of them, are there?" "I think there are 10 at Welwyn; then I have got one at Hastings; there is one at Tonbridge, I think. They are just dotted about."

Attitude of the Corporation.

That will tell you what is the attitude of the builder who has to build to suit the requirements of the public and adapt himself to what it demands of him, and yet here is this corporation, who, as I say, are the vendors and traders of electricity, building houses so that it will be impossible to put gas in. Perhaps, in fairness, I ought to disclose their attitude by quoting it as disclosed in the agenda of their council on October 18, 1934. It says: "Resolved: That the Brighton, Hove, and Worthing Gas Company, Limited, be informed that the corporation are not prepared to give a general permission to case houses in the course of building, for gas." That, gentlemen, is nothing less than a flagrant disregard of the principle and purpose laid down by Parliament in this matter. Unless it is accepted generally it can have no genuine acceptance at all. If the resolution on the agenda means anything, it means:—"We will do as much or as little as we choose to conform to the principles laid down by Parliament." To refuse permission in any instance is in opposition, in perversion and in obstruction of the general purpose of Parliament.

That, gentlemen, is the situation we have reached practically at the present time. We shall resist it by every means in our power. If the Act is to be interpreted by the Brighton Corporation possibly within the strict legal definition, an immense amount of difficulty can be inflicted upon us and an immense amount of unnecessary expense incurred on behalf of the public. But I do sincerely hope that better counsels will obtain in this particular Corporation among the 12 we serve. If they have any desire to cooperate with us in the application of the Act—if anything in the way of friendly and genuine cooperation is sought by them, we are only too happy to render it. We do not want to be at issue with any public authority. With regard to the other 11 public authorities with which we are responsibly connected, our associations are those of amity—I might call it comity—good will, and mutual confidence, and we would desire no other relations with the Brighton Corporation if we were only permitted to establish them.

Benefits of Co-Partnership.

Having dealt in some detail with the figures in the accounts the Chairman proceeded:—

I do not think there is anything more I need draw your attention to except the footnotes. There you see that the Co-partnership Fund is very nearly £100,000, and if it were realized to-day it would fetch about £157,000. This and other dispositions for the employees represent a very important sum indeed, and a proprietor might ask: "What do we get for it?" Well, I can answer that question in two ways—what co-partnership confers and what it avoids. It confers, as you have often heard me say, the sympathetic, active cooperation and association of the employees with the administration of the company to its own end and purpose, identifying the interests of proprietors, employees, and gas consumers side by side.

To realize what is the value of the cooperation and coordination thus obtained, it is necessary to consider what it avoids. Not so very long ago, in a very great industry, one section exacted by way of wages a sum of money which made the payment of dividends on certain portions of the stock of that industry impossible. I am not going to say for one moment whether the demand was just or not; I only wish you to look at it as a fact. By insisting on and obtaining that increase of wages, a large portion of the capital was absolutely sterilized and could not give any return to those who had provided it. But the point I have in mind is this: Here, in a great industry, you have one element, one section, taking deliberate action against the other, *without any consideration of the effect upon the industry as a whole*—an action which would be in an individual a selfish interest in the promotion of a particular end and aim. In that, you have the antithesis of co-partnership. While co-partnership, as we have it here, obtains, you will not be exposed to that danger.

Views of Lord Monkswell and Lord Hugh Cecil.

Let us hear what Lord Monkswell said in the House of Lords on the 13th February on this same subject. He said: "The loss was divided between industry, which was bled at every turn by excessive transport charges, and the railway shareholders, many of whom had ceased to receive any interest on their holdings. The excessive wages of railway servants were certainly one of the major causes of unemployment." He goes on to say: "The railway servants were organized and were represented by trade union officials, who he did not suppose would even pretend that they gave a thought to the solvency of the country apart from the political objects of the trade unions." All this subsisted in the internal organization of a great industry. What earthly hope can there be for a house divided against itself to that extent?

Consider, too, what Lord Hugh Cecil said in addressing a public meeting. He said: "The true solution"—of unemployment—"is to turn the wage-earner into a shareholder." He goes on: "The true ultimate solution of unemployment is something like a system of copartnership." I do think Lord Hugh Cecil is right; it is the organized hostility within the industry of one section against the other, it is the opposition of the employer to the employed and of the employed to the employer that has destroyed confidence throughout the country and has occasioned unemployment in an unprecedented degree. I am perfectly certain that if trade disputes and this internecine hostility could be eradicated—and we have shown it can—then unemployment, like many other evils, would be to a major extent dissipated and dealt with satisfactorily.

The report and accounts having been adopted and the retiring Director and Auditor re-elected, resolutions were passed empowering the Directors to raise from time to time the additional capital authorized by the Brighton, Hove, and Worthing Gas Order, 1931, and the Brighton Gas Order, 1934, and to exercise the statutory borrowing powers of the company in respect thereof. The proceedings then terminated.

Sheffield Gas Company

The Yorkshire Grid, and other matters of general interest, were discussed by the Chairman, Lieut.-Colonel H. K. Stephenson, D.S.O., at the Annual General Meeting this week.

The One Hundred and Thirty-Fifth Ordinary General Meeting of the Sheffield Gas Company was held on March 11 at the Company's Offices, Commercial Street, Sheffield.

Lieut.-Colonel H. K. STEPHENSON, D.S.O., LL.D., J.P. (Chairman of Directors), presided.

The GENERAL MANAGER AND SECRETARY (Mr. Ralph Halkett) read the notice convening the meeting.

FROM THE CHAIRMAN'S ADDRESS.

The CHAIRMAN said: The year which has passed has been an encouraging one from many points of view and it has been by no means uneventful. The improvement in trade on which I commented when we met a year ago has been well maintained and I hope we are justified in thinking that the worst of the depression is over.

Although the Board of Trade Returns for 1934 showed a gratifying increase in both imports and exports, trade is still hampered by the difficulty which so many countries find in balancing their budgets and in our own country by abnormal taxation. The small relief in this burden which the Chancellor of the Exchequer found himself able to afford last April, though welcome, merely whets our appetite for more. Nothing in my opinion would do more to reduce unemployment than further remissions of income-tax, and therefore I very much regret the swollen estimates which the House of Commons is now being asked to approve.

Sheffield industries have benefited by the turn of the trade tide and your Company has shared in their recovery.

Grouping of Gas Undertakings.

The activities of the Gas Industry throughout the country during the past year have been in the direction of what, for want of a better term, I may call rationalization, and a policy of amalgamation and grouping of undertakings has been steadily pursued. In most parts of the country there are numerous undertakings which individually are not equipped to meet the competition of the Electricity Grid, and in such cases unification in some form or other is the surest road to salvation.

It would not be good for the Gas Industry if large undertakings like yours were to allow electricity to supersede gas in neighbouring districts, since if this happened the large undertakings themselves would eventually suffer from infection. It has, therefore, been the policy of your Board for some years past to take such opportunities as offered to extend your Company's area of supply. The Dronfield, Woodhouse, Elsecar, and Baslow Undertakings have in turn been acquired, and with your approval we have recently agreed to purchase, subject to the sanction of the Board of Trade which we are now awaiting, the Matlock and District Gas Company.

This is an important undertaking serving Matlock, Matlock Bath, Darley Dale, and Rowsley, and there appears to be considerable scope for development. It is not unlikely that your Board may ask your consent to further extensions in the near future.

During the year the Gas Undertakings Act, 1934, was placed on the Statute Book, but, though this Act has made some desirable amendments in gas legislation, it does not go so far as our Industry had the right to expect, having regard to the freedom of action accorded to electricity.

The Company's Bill.

Your Company's own Bill also received the Royal Assent last July. This Bill was opposed with great pertinacity by the coal and coke oven interests throughout the country both in the Lords and Commons.

As you will remember, we promoted the Bill because a certain company—a member of the South Yorkshire Grid Company—laid a main from its coke ovens to give a direct supply of gas to a customer in our area of supply. This, though not a breach of law, as no road was broken up, was, in your Board's opinion, a breach of the fundamental understanding on which your Company had undertaken to construct the South Yorkshire Gas Grid, and it was essential to your interests that there should be no further invasion of your Company's area of supply.

As negotiations failed to produce agreement, there was no alternative but to apply to Parliament for the necessary protection. The Act as passed prohibits any coke oven owner from supplying gas within our area of supply, except to works owned or controlled by him.

South Yorkshire Grid Scheme.

The extension of the South Yorkshire Grid Scheme has made progress during the year under review, and the coke ovens of the Manvers Main Collieries, Ltd., are the latest to be linked up.

I have noticed from letters in the Press that there is still a good deal of confusion as to what constitutes a gas grid, many persons appearing to think that the term is applicable to any main from a coke oven to a Gas undertaking. As a matter of fact, the gas grid operated by your Company is the only one in existence in this country, and came into being as the result of the report of the Area Gas Supply Committee set up by the Government under the Chairmanship of Sir Alexander Walker.

This grid, when completed, will be a co-ordinated whole consisting of a trunk main fed by branch mains from the various coke ovens. At present it has no counterpart in this country, but I hear that a similar scheme is contemplated in Scotland.

Increased Gas Output—A Comparison.

As I mentioned when referring to the accounts, our output of gas during the past year exceeded all records, the quantity sold being 5,966,549,000 c.ft. This was an increase of 642,569,000 c.ft., or over 12% above the figure for the previous year.

It may surprise you to hear that, having regard to your Undertaking's declared calorific value of 500 B.Th.U. this is equivalent to an increase of 94,163,000 units of electricity, whereas the Sheffield Corporation Electric Supply Department showed an increase of only 28,710,768 units for the last recorded year.

Moreover, our increase is equivalent to 36·6% of the total sales of electric current by the Sheffield Electric Supply Department during the period referred to. I think you will agree that these figures are rather startling and show conclusively the important part that gas is playing in helping the industries of our city, apart from the services it renders to the domestic consumer.

During the past year the distribution section of your Undertaking has not been idle, and further extensions of mains and services have been made to supply gas to private building estates, the development of which has shown a very desirable increase.

We have also made additional extensions of a similar kind to various estates of the Sheffield Corporation, as well as those which are being developed by the Wortley Rural District Council.

In the Elsecar area, not only have supplies of gas been given to new property, but we have also done a good deal of remedial work in the way of relaying service pipes that were found to be in bad condition.

Success in Combating Electrical Competition.

You will be glad to know that in the Dronfield district, as the result of constant maintenance and supervision, we are successfully combating the very keen electrical competition we have to meet there, and additional houses which have been erected in the district have been supplied with gas.

The service pipes in the Baslow area were found to be in a very bad state, and the work of relaying has been continued throughout the year, with the result that a satisfactory gas supply is now available throughout the whole of this district. Altogether some 40½ miles of new and replacement mains have been laid, including about five miles of the grid main, while no fewer than 5,044 services have been connected.

For the greater part of the year work in the fittings department has been well up to the average, and the demand for various labour-saving appliances, such as the all-enamel gas cookers with thermostatic oven control, enamel gas wash boilers, and small geysers, and other types of hot water apparatus continues unabated.

In spite of the very mild weather the call for gas fires and other heating appliances has been very satisfactory, the aggregate value of the sales of various domestic appliances reaching the record figure of £32,770. Gas cookers, hot plates, and water heating apparatus contributed largely to this total. In this connection I may mention that there are many uses of gas which are by no means so well known as they should be, such as for refrigerators and drying cupboards.

It is most desirable that the public should have some knowledge of the respective costs of heating or cooking by gas as compared with electricity. As I mentioned earlier in my remarks, the declared calorific value of Sheffield gas is 500 B.Th.U., and that much-abused expression of measurement, a therm of gas, is equal to 100,000 B.Th.U., or 200 c.ft. A unit of electricity, on the other hand, equals 3,412 B.Th.U., so that 29·3 units of electricity equal one therm, or 200 c.ft. of gas.

The highest price charged for our gas for domestic purposes is 2s. 9d. per 1,000 c.ft., which is at the rate of 6⅞ d. per therm, or per 200 c.ft. The lowest price, so far as I am aware, which is charged for electricity for heating for domestic purposes is ½d. per unit, which for 29·3 units, equalling one therm or 200 c.ft. of gas, amounts to 1s. 2⅝d. The difference between 6⅞d. per therm and 1s. 2⅝d. for its equivalent in electricity is therefore 8d. In other words, to heat or cook by electricity costs more than twice as much as by gas. Why should people be expected

since loyally cooperated with the gas companies in the operation of the Act and have allowed us facilities for providing to each tenant an opportunity of choosing between gas or electricity as he may please. The only instance to the contrary that I know of is the Brighton Corporation.

The Practical Interpretation of the Act.

Now, gentlemen, however carefully an Act of Parliament may be drawn—and I have been responsible for drafting some private Acts—it is always possible by deliberate intention, by disingenuous treatment, or through ambiguity in terminology to pervert its object.

The only possible practical interpretation and application of this Act is the one given to it all over the country, whether by builders or local authorities—namely, that at the time the municipal dwelling is in course of construction equal facilities should be given to the electrical undertakers and to the gas undertakers to prepare the dwelling so that the ultimate tenant should have a choice between the commodities.

Evidence Before Parliamentary Committee.

When we were before the Committee we adduced evidence to show what was the normal, orthodox way of providing houses of this description and constructing them, and builders responsible for very large expenditure on operations in this way gave evidence in support. This is what one of them, Mr. Braybon, said:—

Counsel put to him: "Out of that total of 1,900 houses for which you have been responsible, could you tell the Committee how many are all-electric?" He said: "Eighty-one." "And the remaining 1,820 all provide for the use of gas?" "Yes." The Chairman: "They are not exclusively gas, are they?" "No; most of them use gas for cooking, and perhaps heating, and electricity for lighting." Mr. Askew: "Putting it quite shortly, in your experience in building these houses and selling them, do you think gas is necessary?" "I do." "Would you be able to sell them if you were not able to provide for a gas supply?" "I would not say I would not be able to sell them, but people, I think, have a preference for gas, seeing the demand there is for the gas house." That is the situation with which the Brighton Corporation were confronted in providing accommodation for these poor people.

We called another witness, Mr. Leo Henry Paul Meyer, and he was examined. Counsel said to him: "Where have your activities chiefly been?" "Mainly around London." "About how many houses have you erected since 1926?" "Somewhere in the neighbourhood of 18,000." "Are practically all those houses speculative houses?" "No, 12,000 are speculative houses; 6,000 were contract houses for municipal authorities." "Did the Reliance Electrical Company, of which you told us you were the managing director, carry out the electrical installation in these houses?" "In the whole of the speculative houses, yes." "What has your experience been as regards the demands of the people who are going to take these houses, for gas and electricity?" "Taking last year's figures, I built last year 5,000 houses (mainly around London that was), and including Hastings, and I have the precise figures of the results, if I can refer to them. I built just over 5,000 houses, and the number of houses in which gas was used for lighting, heating, and cooking—that is to say, with no electricity at all—was approximately—that is, within one or two each way—220; that is all gas complete, with no electricity. The number of houses where electric light was installed for lighting and gas in conjunction with electricity for heating and gas solely for cooking was 4,750 approximately. The number of houses where electricity was installed for lighting, heating, and cooking, with no gas, was 50." "That is all-electric?" "Yes, all-electric." "So that out of 5,000, 4,750 had electric lighting and gas for cooking and gas or electricity for heating?" "That is right." The Chairman.—"What type of houses were these?" "These houses range from £395 selling price to £900." That amply covers the type of house provided for the municipal tenant.

He was asked: "What size would those smallest houses be—the £395 houses?" "Three bedrooms, living room, a combined kitchen and dining-room, and a bathroom." "With your experience, if you had to make your houses 'all-electric,' would you be able to dispose of them?" "Instead of my selling 5,000 a year I would sell about 100 or so. That is my considered opinion." "Where are these 'all-electric' houses; are they all in one area?" "No, they are dotted about." "There are only about 50 of them, are there?" "I think there are 10 at Welwyn; then I have got one at Hastings; there is one at Tonbridge, I think. They are just dotted about."

Attitude of the Corporation.

That will tell you what is the attitude of the builder who has to build to suit the requirements of the public and adapt himself to what it demands of him, and yet here is this corporation, who, as I say, are the vendors and traders of electricity, building houses so that it will be impossible to put gas in. Perhaps, in fairness, I ought to disclose their attitude by quoting it as disclosed in the agenda of their council on October 18, 1934. It says: "Resolved: That the Brighton, Hove, and Worthing Gas Company, Limited, be informed that the corporation are not prepared to give a general permission to carcase houses in the course of building, for gas." That, gentlemen, is nothing less than a flagrant disregard of the principle and purpose laid down by Parliament in this matter. Unless it is accepted generally it can have no genuine acceptance at all. If the resolution on the agenda means anything, it means:—"We will do as much or as little as we choose to conform to the principles laid down by Parliament." To refuse permission in any instance is in opposition, in perversion and in obstruction of the general purpose of Parliament.

That, gentlemen, is the situation we have reached practically at the present time. We shall resist it by every means in our power. If the Act is to be interpreted by the Brighton Corporation possibly within the strict legal definition, an immense amount of difficulty can be inflicted upon us and an immense amount of unnecessary expense incurred on behalf of the public. But I do sincerely hope that better counsels will obtain in this particular Corporation among the 12 we serve. If they have any desire to cooperate with us in the application of the Act—if anything in the way of friendly and genuine cooperation is sought by them, we are only too happy to render it. We do not want to be at issue with any public authority. With regard to the other 11 public authorities with which we are responsibly connected, our associations are those of amity—I might call it comity—good will, and mutual confidence, and we would desire no other relations with the Brighton Corporation if we were only permitted to establish them.

Benefits of Co-Partnership.

Having dealt in some detail with the figures in the accounts the Chairman proceeded:—

I do not think there is anything more I need draw your attention to except the footnotes. There you see that the Co-partnership Fund is very nearly £100,000, and if it were realized to-day it would fetch about £157,000. This and other dispositions for the employees represent a very important sum indeed, and a proprietor might ask: "What do we get for it?" Well, I can answer that question in two ways—what co-partnership confers and what it avoids. It confers, as you have often heard me say, the sympathetic, active cooperation and association of the employees with the administration of the company to its own end and purpose, identifying the interests of proprietors, employees, and gas consumers side by side.

To realize what is the value of the cooperation and coordination thus obtained, it is necessary to consider what it avoids. Not so very long ago, in a very great industry, one section exacted by way of wages a sum of money which made the payment of dividends on certain portions of the stock of that industry impossible. I am not going to say for one moment whether the demand was just or not; I only wish you to look at it as a fact. By insisting on and obtaining that increase of wages, a large portion of the capital was absolutely sterilized and could not give any return to those who had provided it. But the point I have in mind is this: Here, in a great industry, you have one element, one section, taking deliberate action against the other, *without any consideration of the effect upon the industry as a whole*—an action which would be in an individual a selfish interest in the promotion of a particular end and aim. In that, you have the antithesis of co-partnership. While co-partnership, as we have it here, obtains, you will not be exposed to that danger.

Views of Lord Monkswell and Lord Hugh Cecil.

Let us hear what Lord Monkswell said in the House of Lords on the 13th February on this same subject. He said: "The loss was divided between industry, which was bled at every turn by excessive transport charges, and the railway shareholders, many of whom had ceased to receive any interest on their holdings. The excessive wages of railway servants were certainly one of the major causes of unemployment." He goes on to say: "The railway servants were organized and were represented by trade union officials, who he did not suppose would even pretend that they gave a thought to the solvency of the country apart from the political objects of the trade unions." All this subsisted in the internal organization of a great industry. What earthly hope can there be for a house divided against itself to that extent?

Consider, too, what Lord Hugh Cecil said in addressing a public meeting. He said: "The true solution"—of unemployment—"is to turn the wage-earner into a shareholder." He goes on: "The true ultimate solution of unemployment is something like a system of copartnership." I do think Lord Hugh Cecil is right; it is the organized hostility within the industry of one section against the other, it is the opposition of the employer to the employed and of the employed to the employer that has destroyed confidence throughout the country and has occasioned unemployment in an unprecedented degree. I am perfectly certain that if trade disputes and this internecine hostility could be eradicated—and we have shown it can—then unemployment, like many other evils, would be to a major extent dissipated and dealt with satisfactorily.

The report and accounts having been adopted and the retiring Director and Auditor re-elected, resolutions were passed empowering the Directors to raise from time to time the additional capital authorized by the Brighton, Hove, and Worthing Gas Order, 1931, and the Brighton Gas Order, 1934, and to exercise the statutory borrowing powers of the company in respect thereof. The proceedings then terminated.

Sheffield Gas Company

The Yorkshire Grid, and other matters of general interest, were discussed by the Chairman, Lieut.-Colonel H. K. Stephenson, D.S.O., at the Annual General Meeting this week.

The One Hundred and Thirty-Fifth Ordinary General Meeting of the Sheffield Gas Company was held on March 11 at the Company's Offices, Commercial Street, Sheffield.

Lieut.-Colonel H. K. STEPHENSON, D.S.O., LL.D., J.P. (Chairman of Directors), presided.

The GENERAL MANAGER AND SECRETARY (Mr. Ralph Halkett) read the notice convening the meeting.

FROM THE CHAIRMAN'S ADDRESS.

The CHAIRMAN said: The year which has passed has been an encouraging one from many points of view and it has been by no means uneventful. The improvement in trade on which I commented when we met a year ago has been well maintained and I hope we are justified in thinking that the worst of the depression is over.

Although the Board of Trade Returns for 1934 showed a gratifying increase in both imports and exports, trade is still hampered by the difficulty which so many countries find in balancing their budgets and in our own country by abnormal taxation. The small relief in this burden which the Chancellor of the Exchequer found himself able to afford last April, though welcome, merely whets our appetite for more. Nothing in my opinion would do more to reduce unemployment than further remissions of income-tax, and therefore I very much regret the swollen estimates which the House of Commons is now being asked to approve.

Sheffield industries have benefited by the turn of the trade tide and your Company has shared in their recovery.

Grouping of Gas Undertakings.

The activities of the Gas Industry throughout the country during the past year have been in the direction of what, for want of a better term, I may call rationalization, and a policy of amalgamation and grouping of undertakings has been steadily pursued. In most parts of the country there are numerous undertakings which individually are not equipped to meet the competition of the Electricity Grid, and in such cases unification in some form or other is the surest road to salvation.

It would not be good for the Gas Industry if large undertakings like yours were to allow electricity to supersede gas in neighbouring districts, since if this happened the large undertakings themselves would eventually suffer from infection. It has, therefore, been the policy of your Board for some years past to take such opportunities as offered to extend your Company's area of supply. The Dronfield, Woodhouse, Elsecar, and Baslow Undertakings have in turn been acquired, and with your approval we have recently agreed to purchase, subject to the sanction of the Board of Trade which we are now awaiting, the Matlock and District Gas Company.

This is an important undertaking serving Matlock, Matlock Bath, Darley Dale, and Rowsley, and there appears to be considerable scope for development. It is not unlikely that your Board may ask your consent to further extensions in the near future.

During the year the Gas Undertakings Act, 1934, was placed on the Statute Book, but, though this Act has made some desirable amendments in gas legislation, it does not go so far as our Industry had the right to expect, having regard to the freedom of action accorded to electricity.

The Company's Bill.

Your Company's own Bill also received the Royal Assent last July. This Bill was opposed with great pertinacity by the coal and coke oven interests throughout the country both in the Lords and Commons.

As you will remember, we promoted the Bill because a certain company—a member of the South Yorkshire Grid Company—laid a main from its coke ovens to give a direct supply of gas to a customer in our area of supply. This, though not a breach of law, as no road was broken up, was, in your Board's opinion, a breach of the fundamental understanding on which your Company had undertaken to construct the South Yorkshire Gas Grid, and it was essential to your interests that there should be no further invasion of your Company's area of supply.

As negotiations failed to produce agreement, there was no alternative but to apply to Parliament for the necessary protection. The Act as passed prohibits any coke oven owner from supplying gas within our area of supply, except to works owned or controlled by him.

South Yorkshire Grid Scheme.

The extension of the South Yorkshire Grid Scheme has made progress during the year under review, and the coke ovens of the Manvers Main Collieries, Ltd., are the latest to be linked up.

I have noticed from letters in the Press that there is still a good deal of confusion as to what constitutes a gas grid, many persons appearing to think that the term is applicable to any main from a coke oven to a Gas undertaking. As a matter of fact, the gas grid operated by your Company is the only one in existence in this country, and came into being as the result of the report of the Area Gas Supply Committee set up by the Government under the Chairmanship of Sir Alexander Walker.

This grid, when completed, will be a co-ordinated whole consisting of a trunk main fed by branch mains from the various coke ovens. At present it has no counterpart in this country, but I hear that a similar scheme is contemplated in Scotland.

Increased Gas Output—A Comparison.

As I mentioned when referring to the accounts, our output of gas during the past year exceeded all records, the quantity sold being 5,966,549,000 c.ft. This was an increase of 642,569,000 c.ft., or over 12% above the figure for the previous year.

It may surprise you to hear that, having regard to your Undertaking's declared calorific value of 500 B.Th.U. this is equivalent to an increase of 94,163,000 units of electricity, whereas the Sheffield Corporation Electric Supply Department showed an increase of only 28,710,768 units for the last recorded year.

Moreover, our increase is equivalent to 36·6% of the total sales of electric current by the Sheffield Electric Supply Department during the period referred to. I think you will agree that these figures are rather startling and show conclusively the important part that gas is playing in helping the industries of our city, apart from the services it renders to the domestic consumer.

During the past year the distribution section of your Undertaking has not been idle, and further extensions of mains and services have been made to supply gas to private building estates, the development of which has shown a very desirable increase.

We have also made additional extensions of a similar kind to various estates of the Sheffield Corporation, as well as those which are being developed by the Wortley Rural District Council.

In the Elsecar area, not only have supplies of gas been given to new property, but we have also done a good deal of remedial work in the way of relaying service pipes that were found to be in bad condition.

Success in Combating Electrical Competition.

You will be glad to know that in the Dronfield district, as the result of constant maintenance and supervision, we are successfully combating the very keen electrical competition we have to meet there, and additional houses which have been erected in the district have been supplied with gas.

The service pipes in the Baslow area were found to be in a very bad state, and the work of relaying has been continued throughout the year, with the result that a satisfactory gas supply is now available throughout the whole of this district. Altogether some 40½ miles of new and replacement mains have been laid, including about five miles of the grid main, while no fewer than 5,044 services have been connected.

For the greater part of the year work in the fittings department has been well up to the average, and the demand for various labour-saving appliances, such as the all-enamel gas cookers with thermostatic oven control, enamel gas wash boilers, and small geysers, and other types of hot water apparatus continues unabated.

In spite of the very mild weather the call for gas fires and other heating appliances has been very satisfactory, the aggregate value of the sales of various domestic appliances reaching the record figure of £32,770. Gas cookers, hot plates, and water heating apparatus contributed largely to this total. In this connection I may mention that there are many uses of gas which are by no means so well known as they should be, such as for refrigerators and drying cupboards.

It is most desirable that the public should have some knowledge of the respective costs of heating or cooking by gas as compared with electricity. As I mentioned earlier in my remarks, the declared calorific value of Sheffield gas is 500 B.Th.U., and that much-abused expression of measurement, a therm of gas, is equal to 100,000 B.Th.U., or 200 c.ft. A unit of electricity, on the other hand, equals 3,412 B.Th.U., so that 29·3 units of electricity equal one therm, or 200 c.ft. of gas.

The highest price charged for our gas for domestic purposes is 2s. 9d. per 1,000 c.ft., which is at the rate of 6⅔d. per therm, or per 200 c.ft. The lowest price, so far as I am aware, which is charged for electricity for heating for domestic purposes is ½d. per unit, which for 29·3 units, equalling one therm or 200 c.ft. of gas, amounts to 1s. 2⅝d. The difference between 6⅔d. per therm and 1s. 2⅝d. for its equivalent in electricity is therefore 8d. In other words, to heat or cook by electricity costs more than twice as much as by gas. Why should people be expected

to pay 2d. for electricity where less than 1d. worth of gas would do the same work?

More Gas-Fired Furnaces.

Owing to the great increase in the consumption of industrial gas there has been a greater demand for large-capacity meters, several of them providing gas at the rate of 35,000 c.ft. per hour and one at the very unusual rate of 100,000 c.ft. per hour.

More gas-fired furnaces were installed and more furnaces using other fuels were converted to burn gas last year than in any previous year since the war. As an example of our success in displacing other fuels by gas, I may mention that in the case of one important Sheffield firm we took the risk of supplying two gas furnaces on approval. This confidence was not misplaced, and I am pleased to tell you that as the result of exhaustive tests, not only were these two furnaces accepted, but 55 new gas-fired furnaces are now being installed.

Smoke Abatement.

During the year a gas-fired boiler has been supplied and fixed to take the place of a Lancashire boiler. This gas-fired boiler is entirely automatic in action and requires practically no attention whatever. With the change-over to gas in the matter of this boiler, town gas is now the only fuel used at these particular works, which, I understand, are the pride of the Smoke Abatement Committee. This is a striking example of what can be done to banish smoke, dirt, and dust from Sheffield works.

Your Company's patent atmosphere control process continues to command interest and success, the improvement in the quality of the articles produced under this process being quite phenomenal. It is now being applied successfully to the perfectly bright annealing of silver. In the case of nickel silverware, to which I alluded a year ago, this process has resulted in a saving of money equal to three times the cost of the gas consumed.

Our Research Department continues its useful function of helping manufacturers to solve heat treatment problems, and in collaboration with our Industrial Department of demonstrating the utility of gas as a perfectly reliable and economical fuel for all purposes.

Our manufacturing plant, although for the most part only a "standby," has been maintained in good order, and during the winter months we brought into operation two ranges of retorts and the whole of our water gas plant to augment our supplies of coke oven gas.

Street Lighting.

The question of street lighting is always before us, and it is pleasing to be able to put on record the high state of efficiency of the gas street lighting of our city and to call attention to the improved illumination resulting from the more general use of polished metal reflectors. During the year 145 additional gas lamps have been erected and put into operation, bringing the total number of gas lamps in commission within the city boundary to 15,960, this figure including the gas lamps in the Norton Rural District Council's area, which was absorbed into the city as from April 1 last.

Having regard to the efficiency of gas for street lighting and the very low price at which your Company supply it for this purpose, it is not a little surprising to find the lighting authorities of the city are still persisting in their wasteful policy of displacing gas in favour of electricity. Our records show that during the year 63 electric street lamps have been installed in various parts of the city to take the place of 35 gas lamps which have been disconnected.

I cannot believe that the ratepayers of the city approve of such unbusinesslike procedure, and having regard to the breakdowns of electricity for public lighting and all other purposes up and down the country—generally described in our newspapers as "black outs"—it is difficult to see how the interests of the community are served by exchanging a cheap and reliable lighting agent like gas for so dear and uncertain a proposition as electricity.

There are many other points of interest which time will not permit me to mention, as I feel I have already trespassed unduly on your patience.

Services of Officials and Staff.

I am sure, however, you will allow me to add an expression of thanks first of all to my colleagues for their loyal support and secondly to our General Manager, Mr. Halkett, and his staff, as well as to our employees generally for the great services which they have rendered to your Company during the past year.

So far as Mr. Halkett is concerned the year has been for him a very trying one, and I sometimes wonder if the stockholders realize the enormous amount of extra work entailed by Bills in Parliament and Board of Trade Orders, over and above the normal task of efficient management of your Company's affairs.

He has been fortunate in having the loyal assistance of a highly talented staff, and to him and them our thanks are due.

Mr. RALPH HALKETT, General Manager, in the course of a reply, said:

The quantity of gas sold during the year is a record in the history of the Company, and the increase of more than 12% over the previous year, which follows an increase of 7% last year, is certainly very encouraging, proving as it does the continued popularity of gas for all purposes.

Current Year's Promising Start.

Up to the present time we are about 8% up on last year, so this year seems to be promising very well. Although the majority of this big increase is due to the industrial demand, the use of gas for domestic purposes is more than holding its own, in spite of the claims for electricity put forward by our competitors, and the value of the various domestic gas appliances sold during the year constitutes another record for the Company.

In obtaining the powers given to us in the Act, I may say that we rendered a great service to the Gas Industry, particularly in districts where coke ovens' gas supplies are available, as there was a distinct possibility of a similar situation arising to the one which your Company had to face, and I do not think Parliament would hesitate to give to other undertakings protection similar to that which they have accorded to your Company should the necessity arise. In conclusion, I think I may say there are great possibilities for gas in this city both for domestic and industrial use, and saturation point so far as its uses are concerned has by no means been attained yet.

Gas Undertakings' Results for 1934

Aberystwyth.

The Directors' report of the Aberystwyth Gas Company for the year ended Dec. 31, 1935, states that the Board regret the death of Captain Edward Llewellin, who had been connected with the Company for 34 years, and for the last few years was Chairman of the Board of Directors. He was devoted to the Company, which he served most faithfully. The vacancy has been filled by the appointment of Mr. E. H. Davies, who resigned his position as Auditor; Messrs. Cash, Stone, & Co., Chartered Accountants, were appointed to fill that position. The balance of net revenue, after taking into account the sum of £1,771 brought forward from 1933, and after payment of debenture interest and dividends to June 30, 1934, and transferring £550 to the reserve fund, amounts to £3,436. The Directors recommend the payment of the usual dividends, less income-tax—viz., at the rate of 15% per annum on the original shares, 10½% on the new shares, 5% on the preference shares, and 4½% interest on the debenture bonds, less interim dividends paid on Sept. 1 last, leaving £2,084 to be carried forward to the next account.

Auckland (New Zealand).

The report and balance-sheet for the year ended Dec. 31, 1934, presented at the 73rd annual meeting of the shareholders of the Auckland Gas Company, Ltd., state that the profits, after deducting working expenses, rates and taxes, depreciation, and other charges, amount to £68,008, to which has to be added the carry forward at the credit of profit and loss after the deduction of the February dividend, a sum of £1,073, making the amount at credit of profit and loss £69,076, which, less interim dividend, paid August, 1934, £30,937, leaves a balance to be dealt with of £38,139. The Directors recommend a dividend of 2½% for the half-year (which, with the 2¾% paid in August last, makes a total of 5½% for the year) on the £1 fully-paid shares, and proportionate amount on the contributing shares of 15% paid, £30,937, leaving to be carried forward the sum of £2,203. £5,000 has been added to the income-tax reserve account, bringing this amount up to £60,000.

Cleveland.

The report of the Directors of the Cleveland Gas Company for the half-year ended Dec. 31, 1934, states that the amount of gas sold reached a total of 13,299,600 c.ft. and realized £3,382. Ordinary consumers are now being charged 1s. 3d. per therm. The profit made during the half-year has been £565, to which must be added the amount, brought forward from last half-year, of £4,480, making the balance at the credit of the profit and loss account at Dec. 31, 1934, £5,045, which sum the Directors propose to dispose of as follows: In paying a dividend at the rate of 2% per annum (less income-tax) for the half-year, £399; to reserve for renewal of carbonizing plant, £100; to contingent account, £100, leaving to be carried forward to next half-year's account £4,446.

East Grinstead.

In submitting the annual statement of accounts for the year ended Dec. 31, 1934, the Directors of the East Grinstead Gas and Water Company report that the receipts from gas and meter and stove rentals amounted to £21,018; from residual products, £5,380; and from water and meter rental, £11,179. After payment of the interim dividend interest on debenture and other fixed charges, the profit and loss account shows a balance of

£11,243 available for dividends, from which the Directors recommend payment for the half-year ended Dec. 31, 1934, of £3% on the preference shares, £5% on the original "A" stock and "A" shares, and £3 10s.% on the "B" and "C" shares (less income-tax), which with the interim dividend paid on Sept. 1 last on the preference shares, "A" stock and "A" shares, and "B" and "C" shares, will make £6, £10, and £7% respectively for the year. This will absorb £3,101, and leave a balance to be carried forward of £8,142. The sale of gas continues to increase. The expansion of the business of the Company makes it necessary for further capital to be raised, and an extraordinary general meeting of the shareholders was called to authorize the raising, as required, of £11,821.

European Gas Company, Ltd.

The report of the Directors of the European Gas Company, Ltd., for the year ended Dec. 31, 1934, states that trading conditions in France were affected by the political crisis and by the general stagnation in commerce and industry; the consumption of gas suffered in consequence, and the quantity sold shows a decrease of 1·43% as compared with 1933. The number of consumers rose from 165,600 to 167,291, a gain of 1,691, or at the rate of 1·02%, and there was a substantial increase in the volume of sales of gas-consuming appliances. After meeting all charges, and making provision for French and English taxation and for renewals and replacements, the profit on the year's operations amounts to £64,931. An interim dividend at the rate of 2½% was paid in October last, and the Directors now recommend that a final dividend of 3½% be paid, making a total of 6% for the year, free of income-tax, and that the balance of £4,800 be carried to general revenue. At Caen the showroom was modernized. At Havre good progress was made with the construction of the new showroom and office premises. The new Works at Roche Maurice, Nantes, were completed and put into action during the year. The concession for the supply of gas to the town of Caen was renewed for a period of 30 years.

Hexham.

The Hexham Gas Company reports a gross profit for the year ended Dec. 31 last of £3,069. A dividend on the ordinary stock is recommended, making, with the interim dividend paid in September last, £5 10s.% for the year.

Horley.

The Directors' report and statement of accounts of the Horley District Gas Company for the year ended Dec. 31, 1934, state that the gas made amounted to 521,196 therms. After payment of dividends in respect of the half-year ended June 30, 1934, at the standard rates, all less income-tax, and providing for the fixed charges for interest, &c., the profit and loss account shows an available balance of £5,064. The Directors recommend payment of dividends in respect of the half-year ended Dec. 31, 1934, at the rate of 5% per annum on the preference stock; 10% per annum on the "A" capital stock; and 7% per annum on the additional "B" capital stock (all less income-tax), which will absorb the sum of £2,187, leaving a balance of £2,877 to be carried forward to the next account.

Keswick.

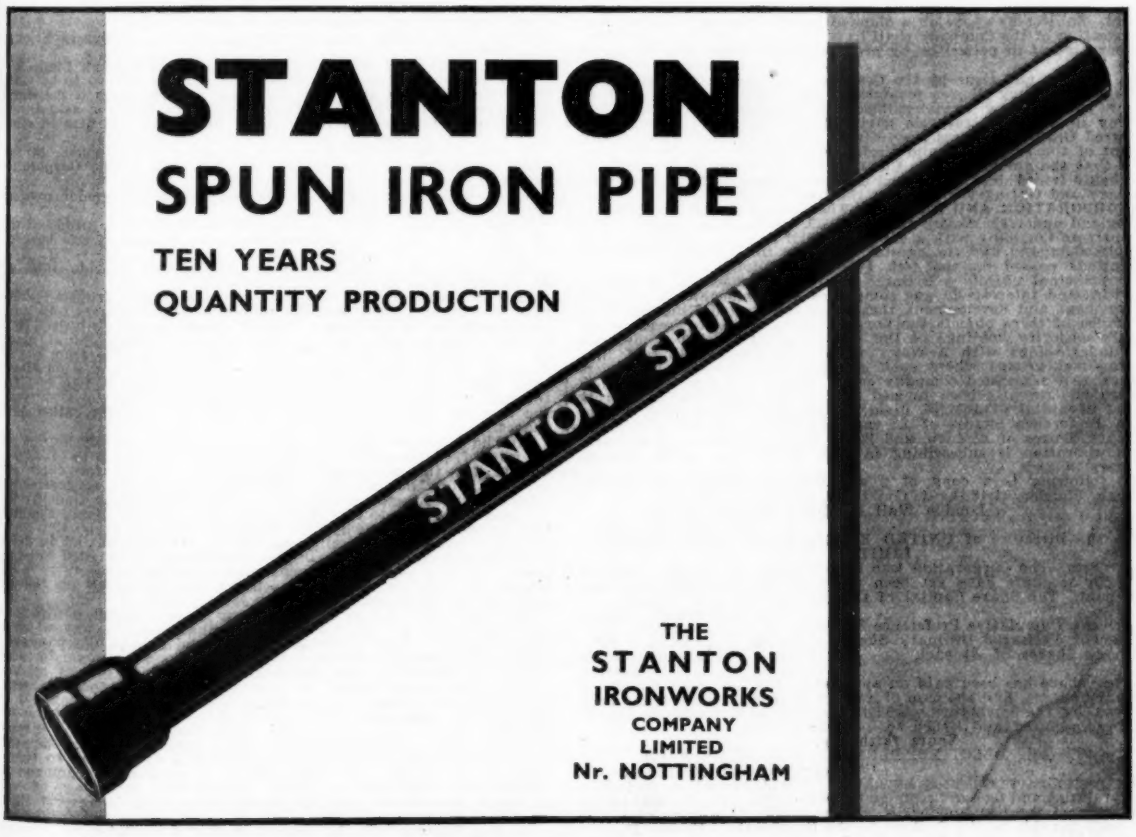
The revenue account of the Keswick Gas Company shows a credit balance of £2,316 on the year's working. The Directors propose a dividend of 10% per annum on the original capital of the Company and 7% on the additional capital. £750 is to be added to the contingent fund. This would leave £550 to be added to the profit account. There has been a slight increase in the output of gas, which established a record. The price of gas is to be reduced ½d. per therm or 2½d. per 1,000 c.ft., making it 3s. 9d. per 1,000 c.ft., as against 3s. 11½d. During his three years as Manager and Secretary, Mr. H. M. Tysoe had helped the Company to reduce the price of gas from 4s. 4½d. to 3s. 11½d. per 1,000 c.ft.

Leyland.

The Leyland Gas Company paid a dividend at the rate of £5% per annum in respect of the half-year ended Dec. 31, 1934, on both ordinary and preference shares. The quantity of gas sold showed an increase of over 5% on the corresponding period for the previous year. There had also been a record demand for gas appliances, and the number of these sold had increased 80%.

Swansea.

The report and statement of accounts of the Swansea Gas Light Company for the year ended Dec. 31, 1934, show that the Directors recommend the declaration and payment of a dividend of 5½% per annum for the year ended Dec. 31, 1934, on the redeemable preference stock of the Company, of which an interim dividend at the rate of 5½% per annum for the half-year ended June 30, 1934, has already been paid. The Directors also recommend the declaration and payment of a dividend of 5% per annum for the year ended Dec. 31, 1934, on the ordinary stock of the Company, of which an interim dividend at the rate of 5% per annum for the half-year ended June 30, 1934, has already been paid. Receipts from the sale of gas totalled £130,527, coke and breeze £13,042, and tar £1,795.



For information only. This is not an invitation to the public to subscribe.

UNITED KINGDOM GAS CORPORATION, LTD.

(Incorporated under the Companies Act, 1929.)

SHARE CAPITAL - - - £1,500,000

Authorised.		Issued.
£500,000	4½% Cumulative Preference Shares ...	—
£500,000	Preferred Ordinary Shares (entitled to a fixed non-cumulative dividend at the rate of 4½%)	—
£500,000	Ordinary Shares	£500,000
£1,500,000		£500,000

Directors:

ANGUS VALDEMAR HAMBRO, J.P., Merly House, Wimborne, Dorset.
RICHARD BRUCE HAMILTON OTTLEY, 48, Seymour Street, London, W.1. (Director of Erlangers Limited.)
MICHAEL HUBERT TETLEY, M.I.Mech.E., Belmont, Hoddesdon, Herts. (Director of Imperial Continental Gas Association.)
JOHN MICHAEL WHITTINGTON, The Flint House, Goring Heath, Oxon. (Director of South Western Gas and Water Corporation Limited.)

Bankers:

HAMBROS BANK LIMITED, 41, Bishopsgate, London, E.C.2.
ERLANGERS, LIMITED, 4, Moorgate, London, E.C.2.

Solicitors:

HERBERT SMITH & CO., 62, London Wall, London, E.C.2 (for the Company).
SLAUGHTER & MAY, 18, Austin Friars, London, E.C.2 (for the Issue.)

Auditors:

DELOITTE, PLENDER, GRIFFITHS & CO., Chartered Accountants, 5, London Wall Buildings, London, E.C.2.

Brokers:

HAES & SONS, 124, Old Broad Street, London, E.C.2.

Managers, Secretaries and Registered Office:

CLOSE BROTHERS LIMITED, 9, Clements Lane, Lombard Street, London, E.C.4.

Particulars of an Issue at par of 500,000 Ordinary Shares of £1 each (5/- paid)

(The balance of 15/- per share has not yet been called up.)

DIVIDEND RIGHTS.—The profits of the Company available for dividend and determined to be distributed in respect of each year are to be applied in order of priority in the following manner:—

(a) To the payment of a fixed cumulative preferential dividend at the rate of 4½ per cent. per annum on the capital for the time being paid up or credited as paid up on the Preference Shares.

(b) Subject thereto to the payment of a fixed non-cumulative preferential dividend at the rate of 4½ per cent. per annum on the capital for the time being paid up or credited as paid up on the Preferred Ordinary Shares, and

(c) Any balance of such profits remaining after the distributions aforesaid shall be divided amongst the holders of the Ordinary Shares in proportion to the amounts paid up or credited as paid up thereon respectively.

CAPITAL RIGHTS.—In the event of the Company being wound up the surplus assets available for distribution amongst the Members are applicable in the order of priority and manner following, that is to say:—

First to the repayment to the holders of the Preference Shares then issued and outstanding of the amounts for the time being paid up or credited as paid up on such shares together with all arrears of the fixed cumulative preferential dividend whether declared or undeclared down to the date of such repayment;

Secondly to the repayment to the holders of the Preferred Ordinary Shares then issued and outstanding of the amounts for the time being paid up or credited as paid up on such shares;

Thirdly, the residue shall be distributed amongst the holders of the Ordinary Shares in proportion to the amounts paid up or credited as paid up on such shares respectively.

VOTING RIGHTS.—Neither the Cumulative Preference Shares nor the Preferred Ordinary Shares confer the right to receive notice of or attend and vote at General Meetings except (i) in the case of proposals to wind up the Company or to alter the Articles of Association in any manner directly affecting the rights and privileges attached to such shares; (ii) if the dividend on the Cumulative Preference Shares shall be in arrear for more than six months from the half-yearly dates fixed for payment thereof, viz.: 1st June and 1st December and then only for so long as the dividend shall remain unpaid. Subject as above on a show of hands every member present at a meeting of the Company shall have one vote and on a poll every member present in person or by proxy shall have one vote for every share held.

The creation and issue by the Company of further Preference and Preferred Ordinary Shares (conferring the right to a dividend at such a rate as may be determined not exceeding 7 per cent. but ranking in all other respects pari passu with the Preference and Preferred Ordinary Shares respectively can be effected without any consent of the Preference and Preferred Ordinary shareholders provided that the amount of the Cumulative Preference Shares for the time being issued does not exceed the total amount of the Preferred Ordinary and Ordinary Shares for the time being issued.

INCORPORATION AND OBJECTS.—The Company was incorporated in England under the Companies Act, 1929, on the 25th January, 1935, as a private Company with a capital of £100 and was converted into a public Company and the capital increased to £1,500,000 by Special Resolutions passed on the 14th February, 1935.

The principal objects are (inter alia) the acquisition of shares, securities and interests in gas companies and undertakings and the management and development thereof in the United Kingdom. In pursuance of these objects the Corporation proposes to invest in or acquire majority holdings of the share capital of such companies and undertakings with a view to the co-ordination thereof into geographical groups where such grouping will benefit the undertakings. An associated company called Caledonian Gas Corporation Limited has recently been formed in Scotland with similar objects having a capital of £625,000, divided into 312,500 4½ per cent. Cumulative Preference Shares of £1 each, 187,500 4½ per cent. Preferred Ordinary Shares of £1 each, and 125,000 Ordinary Shares of £1 each. The Corporation is subscribing in cash at par for 103,000 of such Ordinary Shares.

The following is a copy of a statement received from Messrs. Deloitte, Plender, Griffiths & Co., the Company's auditors:—

5, London Wall Buildings, London, E.C.2.
28th February, 1935.

To the Directors of UNITED KINGDOM GAS CORPORATION LIMITED.

Dear Sirs,—The Corporation was incorporated on the 25th January 1935. No accounts have yet been made up and no dividends have been paid. The Share Capital of the Corporation is as follows:—

	Authorised.	Issued.
4½ per cent. Cumulative Preference Shares of £1 each	£500,000	Nil
4½ per cent. Preferred Ordinary Shares of £1 each...	£500,000	Nil
Ordinary Shares of £1 each	£500,000	500,000 Shares.

5s. per share has been paid on application for the above-mentioned Ordinary shares, and the sum of £125,000 in respect thereof has been received by the Corporation. The whole of such Ordinary shares has been allotted and issued 5s. per share paid.

Yours faithfully,
(Signed) DELOITTE, PLENDER, GRIFFITHS & CO.,
Chartered Accountants, Auditors.

The preliminary expenses payable by the Corporation including capital duties and fees and costs and expenses of and incidental to the formation of the Corporation, legal expenses, a brokerage of ½ of 1 per cent. payable to the Brokers to the Corporation, Messrs. Haes & Sons, of 124, Old Broad Street, London, E.C.2, and the commission payable on the issue of the Ordinary shares under Contract No. (3) below mentioned are estimated at £12,500. The sum available to the Corporation at the date of this statement for working capital is £112,500. In the opinion of the Directors, this sum is sufficient for the immediate purposes of the Corporation.

No part of this issue of shares has been underwritten, and except for the brokerage above mentioned and the commission mentioned under Contract No. (3) no commission discounts or other payments have been made or allowed to any person and there is no fee payable to any promoter in connection with the issue or sale of any share capital of the Corporation.

The following Contracts which are or may be material have been entered into:

(1) Dated 26th February 1935 between the Corporation and Close Brothers Limited appointing Close Brothers Limited sole negotiating agents of the Corporation for seven years from 15th February 1935 to negotiate for the acquisition of interests in Gas Companies and undertakings in the United Kingdom at a remuneration of 2 per cent. of the amount paid whether in cash or otherwise by the Corporation for acquisitions of any gas or other undertakings and interests therein. By contract dated 27th February 1935 Close Brothers Limited have agreed to pay to Hambros Bank, Limited, Erlangers Limited and Philip Hill and Partners Limited one-quarter of such remuneration in consideration of services to be rendered by them in connection with such negotiations.

(2) Dated 26th February 1935 between the Corporation and Close Brothers Limited appointing Close Brothers Limited Managers, Secretaries and Registrars of the Corporation for seven years from the 15th February 1935 at an annual remuneration of ¼ of one per cent. upon the amount of the issued Share and Loan capital of the Corporation for the time being; Close Brothers Limited are also to be repaid all travelling and other special out of pocket expenses.

(3) Dated 26th February 1935 between the Corporation and Hambros Bank Limited, Erlangers Limited and Philip Hill and Partners Limited, appointing such companies financial advisers to the Corporation for a period of seven years from the 15th February 1935, at a remuneration therefor and for other services in connection with issues of capital of the Corporation equal to one per cent. of the amount of all issues including premium (if any) whether for cash or otherwise of share and loan capital made by the Corporation.

The Directors are interested as follows:—

Mr. R. B. H. Ottley is a Director of and shareholder in Erlangers Limited.

Mr. A. V. Hambro is a shareholder in Hambros Bank Limited.

Save as aforesaid no sums have been paid or agreed to be paid to any Director or to any firm of which a Director is a member by any person to induce him to become or to qualify him as a Director or otherwise for services rendered by him or by his firm in connection with the promotion or formation of the Corporation.

No loan capital has been created or agreed to be issued. No mortgages or charges are subsisting on any part of the Corporation's assets.

No share or loan capital of the Corporation is under option or agreed to be put under option.

Except as above stated, no property has been or is proposed to be acquired and there are no Vendors, and no amount has been paid or will be paid for goodwill.

The Articles of Association of the Corporation provide (inter alia) as follows:—

(22) The Board may from time to time make calls upon the Members in respect of any moneys unpaid on their shares and not by the conditions of allotment thereof made payable at fixed times, provided that no call shall exceed one-fourth of the nominal amount of the shares or be payable at less than two months from the date fixed for the payment of the last previous call, and each Member shall (subject to receiving at least fourteen days' notice specifying the time or times and place of payment) pay to the Company at the time or times and place so specified the amount called on his shares.

(92) The Directors shall be paid out of the funds of the Company by way of remuneration for their services at the rate of £500 per annum for the Chairman and £300 per annum for each other Director, and the Directors shall also be entitled to receive such additional remuneration (if any) as the Company in General Meeting may from time to time determine, any such additional remuneration to be divided amongst the Directors in such proportion and in such manner as they shall from time to time agree and in default of agreement equally. The Directors shall also be entitled to be paid their travelling and hotel expenses of attending and returning from Board Meetings or otherwise incurred while engaged on the business of the Company.

(93) A Director of this Company may be or become a director or other officer of any other company, including a company which has been already or may hereafter be promoted by this Company, or in which this Company may be or become interested, as a vendor, shareholder or otherwise, and no such Director shall (unless otherwise determined by the Board) be accountable for any benefit received as a Director, officer or member of such other company, and particularly every such Director of this Company may in exercise of the voting power of this Company at General Meetings of such other company resolve what remuneration, commission, salary, percentage of profits or bonus may from time to time be paid to the directors or other officers of such other company and receive such remuneration, salary, commission, percentage of profits or bonus accordingly without being accountable in respect thereof to this Company.

(94) Any Director who by request performs special services or goes or resides abroad for any purposes of the Company, shall (unless otherwise expressly resolved by the Company in General Meeting) receive such extra remuneration by way of salary, percentage of

[Continued on next page.]

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

The Stock Exchange has passed through another disappointing week, and business generally was on a reduced scale, with price movements against holders. The reason for the set-back is almost wholly attributable to a combination of disturbing factors which have suddenly arisen, notably a new low record for sterling and several political incidents, such as the revolution in Greece and the postponement of Sir John Simon's visit to Berlin. Liquidation by nervous holders also played a large part in the reactionary movement. Gilt-edged and other high-class investment stocks were the chief sufferers, and despite a large number of good reports the Industrial market fared little better. Towards the close on Friday, which also saw the end of a three-week account, conditions were a little steadier, while the general undertone became more confident.

As a result of the above circumstances it was not surprising to see further depreciations in the values of gas securities, and a glance at the Stock and Share List will show how these fared last week. During the past fortnight some of the leading ordinary stocks have dropped from 10 to 12 points, and at current prices present an attractive proposition. In the absence of further disturbing factors it appears unreasonable to assume that prices will go much lower, especially in view of the fact that with only two exceptions, in which ¼% reductions took place, all the companies in the List maintained their dividend rates last year, while in one case (Portsmouth) the rate was increased by ¼%. Apart from Gas Light units, on which the yield at the current price works out at £4 6s.%, the return on the ordinary stocks of the larger undertakings is now a little over 4½%, which is high for the security offered.

The Commercial Gas Company has placed privately £145,000 new 3% perpetual debenture stock, which will rank *pari passu* with £475,000 similar stock now in existence. The new stock is on offer at 87, free of expense, and holders will receive a full half-year's interest in June next.

Current Sales of Gas Products

The London Market for Tar Products.

LONDON, *March* 11.

There are no changes in the prices of tar products, which are as follows:

Pitch, 40s. to 42s. 6d. per ton f.o.b.

Creosote, 5d. to 5½d.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 2d. to 2s. 3d.; pure benzole, 1s. 9d. to 1s. 10d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 5s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

March 11.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 25s. Pitch—East Coast, 40s. to 41s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 40s. to 41s. 6d.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¼d. to 6¾d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 4¾d. Heavy naphtha, North, 9¾d. to 10¾d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 4¾d.; low gravity, 4⅜d. to 4½d.; Scotland, 4⅜d. to 4½d. Heavy oils, in bulk, North, 4d. to 4¼d. Carbolic acid, 60's, 1s. 9d. to 1s. 10d. Naphthalene, £10 to £11. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *March* 9.

Although inquiries are quite numerous, there is very little business behind them. Meantime values are fairly steady in all departments.

Crude gas-works tar.—Actual value remains at 29s. to 31s. per ton *ex* works in bulk.

Pitch is without interest at 42s. to 43s. per ton f.o.b. Glasgow for export and round 40s. to 42s. 6d. per ton *ex* works in bulk for home trade.

Refined tar is being held for 3d. to 3⅛d. per gallon, f.o.r. naked.

Creosote Oil.—Prompt supplies are particularly scarce, but values show no alteration. B.E.S.A. Specification, 4⅜d. to 5d. per gallon; low gravity, 4⅜d. to 5d. per gallon; and neutral oil, 4⅝d. to 4⅞d. per gallon; all f.o.r. in bulk.

Cresylic acid is in poor call, but quotations are well held. Pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 1d. to 1s. 2d. per gallon; and pale, 99/100%, 1s. 4d. to 1s. 5d. per gallon; all *ex* works.

Crude naphtha is valued at 4¼d. to 4¾d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3d. to 1s. 4d. per gallon, and 90/190 heavy is 9d. to 10d. per gallon.

Motor benzole is available at 1s. 2½d. to 1s. 3½d. per gallon in bulk *ex* works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	8½	to	0	9	per gallon at works
Motor "	1	2	"	1	2½	" " "
90% "	1	3	"	1	3½	" " "
Pure "	1	6½	"	1	7	" " "

Contracts Advertised To-Day

Coal.
Coalville Urban District Council. [p. 652.]
Morley Gas Department. [p. 651.]

Cookers, Fires, Geysers, Washing Machines, &c.
Lincoln Gas Department. [p. 651.]

General Stores, Tinware, Proprietary Articles, &c.
Lincoln Gas Department. [p. 651.]

Lighting Goods.
Workington Gas Department. [p. 651.]
Lincoln Gas Department. [p. 651.]

Meters.
Workington Gas Department. [p. 651.]

Meters, &c.
Lincoln Gas Department. [p. 651.]

Oxide of Iron.
Lincoln Gas Department. [p. 651.]

Paints, Oils, &c.
Lincoln Gas Department. [p. 651.]

Pipes, &c.
Lincoln Gas Department. [p. 651.]
Workington Gas Department. [p. 651.]

Retorts.
Brighouse Corporation. [p. 651.]

Sulphuric Acid.
Lincoln Gas Department. [p. 651.]

Tar and Liquor.
Workington Gas Department. [p. 651.]

UNITED KINGDOM GAS CORPORATION, LTD.—*Continued from p. IX.*

profits or otherwise as the Board may determine, which shall be charged as part of the Company's ordinary working expenses.

(95) The qualification of a Director shall be the holding alone and not jointly with any other person, of shares or stock of the Company of any class or classes of the nominal amount of £500, and this qualification shall be required as well of the first Directors as of all future Directors. A Director may act before obtaining his qualification, but if not already qualified, shall obtain his qualification within two months after his appointment, or in default, his office shall be vacated. If a Director at any time after the expiration of two months from the date of his appointment cease to hold his qualification, his office shall be vacated. A person vacating office under this Article shall be incapable of being reappointed a Director until he shall have obtained his qualification.

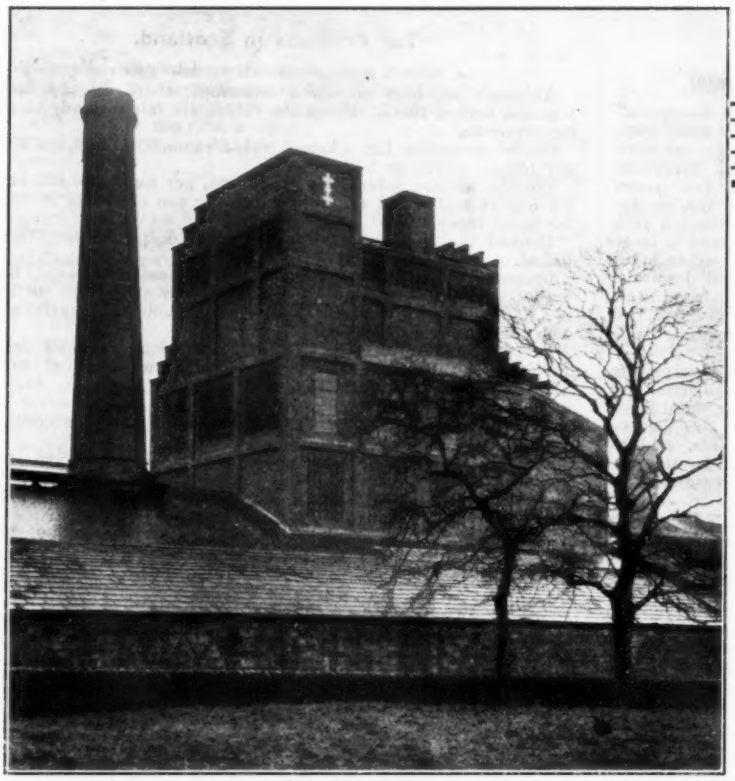
(97) Any Director may be appointed by the Board to any other office or place of profit under the Company, except that of Auditor, for such period, on such terms and at such remuneration (by way of salary, percentage of profits or otherwise) as the Board may determine, and such remuneration shall be charged as part of the Company's ordinary working expenses.

(102) The Board may exercise all the powers of the Company to borrow or raise money and to mortgage or charge its undertaking, property, and uncalled capital and to issue Debentures or other securities. Provided that the amount for the time being remaining outstanding of moneys so borrowed or raised by the Board for the purposes of the Company otherwise than by the issue of share capital, by unsecured overdraft facilities granted by bankers, or by charges or liens on goods and mercantile documents in favour of bankers and others effected in the ordinary course of business) shall not at any time without the previous sanction of an Extraordinary Resolution of the Company in General Meeting exceed 50 per cent. of the total nominal amount of the share capital of the Company for the time being issued and outstanding, but no debt incurred or security given in respect of moneys borrowed or raised in excess of the limit hereby imposed shall be invalid or ineffectual except in the case of express notice at the time it was incurred or the security given that the limit hereby imposed had been exceeded.

(108) A Managing Director, Technical Director, Assistant Managing Director, Manager, or Technical Manager shall receive such remuneration (whether by way of salary, commission or participation in profits or partly in one way and partly in another) as the Board may determine, and such remuneration may be either in addition to or in substitution for any remuneration which he may receive as a Director of the Company.

A print of the Memorandum and Articles of Association of the Corporation and copies of the above-mentioned contracts and Auditors' Certificate are available for inspection at the offices of the Corporation's Solicitors, Herbert Smith & Co., 62, London Wall, London, E.C.2, at any time during usual business hours within seven days of the date of publication of these particulars.

London, 6th March, 1935.



THIS installation of Glover-West Vertical Retorts at the gas works of the Yeadon & Guiseley Gas Company was put into service on December 27th, 1934

The first month's run under normal conditions of the Glover-West plant at Yeadon gave these results:

Coal Carbonized... ... YORKS. GAS NUTS

Total Gas Made ... ...18,104,000 C. FT.

Gas Made per Ton ... 17,060 C. FT.

Calorific Value (*undebenzolized*) **500 B.Th.U./C.FT.**

Therms per Ton ... ... 85·3

West's Steaming Curve ... No. 1 PLUS

More than 360 installations of Glover - West verticals are in service

WEST'S GAS IMPROVEMENT CO., LTD.

LONDON: REGENT HOUSE, KINGSWAY, W.C. 2. 'Phone: Holborn 4108. 'Grams: "Imvertret, Westcent." **MANCHESTER:** ALBION IRONWORKS, MILES PLATTING. 'Phone: Collyhurst 2961. 'Grams: "Stoker, Manchester."

STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, March 8.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Sept. 10	7	7	Alliance & Dublin Ord. ...	135—145	...	...
374,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	90—100	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	167—172*	...	...
300,000	1	Oct. 8	1/9⅜	1/4½	Bombay, Ltd.	30/—32/-	...	30/6
178,480	Stk.	Feb. 18	9½	9½	Bournemouth sliding scale ...	220—230*	−3	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	167—172*	−3	171½—174½
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152*	−1	149—151½
50,000	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	86—91	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	107—112	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	130—135	...	...
357,900	,,	Feb. 18	7½	7½	Brighton, &c., 6 p.c. Con. ...	177—182*	−1	181½—182
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	159—164*	...	160—164
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150*	...	...
1,487,500	,,	Feb. 4	5	5	Bristol, 5 p.c. max.	119—120a	...	...
120,420	,,	Dec. 17	4	4	Do. 1st 4 p.c. Deb. ...	102—104a	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	102—104a	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	122—124a	...	...
855,000	,,	Sept. 24	8	7	British Ord.	173—178	...	170
100,000	,,	Dec. 17	7	7	Do. 7 p.c. Pref.	160—165	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—102	...	97½
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	111—116	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Dec. 17	4½	4½	Do. 4½ p.c. Deb. ...	88—93	...	89¾—90½
626,860	,,	Jan. 21	6	6	Cardiff Con. Ord.	130—135	−3	...
237,860	,,	Dec. 17	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	,,	Feb. 4	5	6½	Chester 5 p.c. Ord.	111—116b	...	...
98,936	1	Sept. 24	2/-	2/-	Colombo, Ltd., Ord.	1⅝—1⅞	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	21/—23/-	+1/6	20/6—21/10½
609,204	1	Sept. 24	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20/6—22/6	+/6	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	25/—27/-	...	...
1,775,005	Stk.	Feb. 4	5	6	Commercial Ord.	115—120	−2	115—117
475,000	,,	Dec. 3	3	3	Do. 3 p.c. Deb. ...	85—90	−2	...
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128*	...	...
807,560	,,	Feb. 18	7	7	Croydon sliding scale... ...	155—160*	−8	159—166½
569,590	,,	,,	5	5	Do. max. div.	113—118*	−1	115
620,385	,,	Dec. 17	5	5	Do. 5 p.c. Deb.	130—135	...	130—132½
542,270	,,	Feb. 18	7	10	Derby Con.	190—200c*	−10	...
55,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	100—105c	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c.	111—116	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	−7	131—135
175,609	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	120—125	−3	122
1,002,180	,,	Sept. 10	†7	†5	European, Ltd.	117—122	−1	117—117½
19,313,481	,,	Feb. 4	5½	5½	Gas Light & Coke 4 p.c. Ord.	25 6—26 6f	−·6	25 6—26 6
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	87—92	−3	88½—91½
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—110	−1	105—106½
6,102,497	,,	Dec. 3	3	3	Do. 3 p.c. Con. Deb. ...	87—92	−1	88½—90
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	116—119	...	116
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	114—117	...	115½—116½
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140*	−3	139½
140,000	1	Sept. 24	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅝—1⅞	...	...
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3½ p.c.... ...	128—138*	−4½	129—130
5,600,000	,,	Oct. 22	14	10	Imperial Continental Cap. ...	210—215	−5	210—218½
223,130	,,	Jan. 21	3½	3½	Do. 3½ p.c. Red. Debs.	91—96·	...	...
285,242	,,	Feb. 18	8½	8½	Lea Bridge 5 p.c. Ord. ...	180—190*	−7	...
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord.... ...	136—140b	−2½	...
245,500	,,	Dec. 17	5	5	Do. 5 p.c. Red. Pref. ...	105—110b	...	...
306,083	,,	Jan. 16	4	4	Do. 4 p.c. Deb.	104—107b	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195*	...	...
63,480	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	83—88	...	...
75,000	,,	Dec. 3	†10	†10	Malta & Mediterranean ...	205—215	...	...
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb. ...	102—107	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	111—113
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	101—106	...	104
360,075	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	127—132	...	...
125,000	—	Jan. 2	11/8	3½	Do. 3½ p.c. Rd. Rg. Bds.	98—101	...	...
675,000	,,	May 28	†6	††3	Montevideo, Ltd.	55—65	...	50
2,061,315	,,	Feb. 18	5	5¾	Newcastle & Gateshead Con.	25/—25/9df	−/4½	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107d	...	...
776,706	,,	Dec. 17	3½	3½	Do. 3½ p.c. Deb. ...	101½—102½d	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107d	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	108—110a	...	...
225,000	,,	Feb. 18	7½	7½	North Middlesex 6 p.c. Con.	172—177*	...	...
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Nov. 5	†7	†9	Oriental, Ltd.	170—175	...	...
416,617	,,	Dec. 17	8	8	Plym'th & Stonehouse 5 p.c.	178—183	−4	...
504,416	,,	Feb. 4	8	8½	Portsm'th Con. Stk. 4 p.c. Std.	180—185	−2	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	Jan. 21	5	5	Preston 5 p.c. Pref.	108—113	...	...
1,736,968	Stk.	Aug. 27	6	6	Sheffield Cons.	144—146e	−2	...
95,000	,,	Jan. 7	4	4	Do. 4 p.c. Deb.	100—104e	...	...
133,201	,,	Feb. 18	8½	5	Shrewsbury 5 p.c. Ord. ...	150—155*	−3	...
90,000	10	May 28	†4	†3	South African	3—4	...	...
927,177	1	Sept. 10	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	28/—30/-	...	28/-
736,061	1	,,	-/10½	-/10½	Do, 4½ p.c. Red. Cum. Pref.	22/6—23/6	...	22/6—22/9
450,000	Stk.	Feb. 4	7¼4	4	Do. 4 p.c. Red. Deb. ...	100—103*	...	...
6,709,895	,,	Feb. 4	5	6½	South Met. Ord.	122—127	−3	120—128½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	−2	148—150
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	104—109	−1	108
1,895,445	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	86—91	...	87—88½
1,000,000	,,	Jan. 7	5	5	Do. 5 p.c. Red. Deb....	113—118	−4	116—118½
209,820	,,	Feb. 18	8½	8½	South Shields Con.	174—176d	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	130—140*	−7½	130—137
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127*	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	102—107*	−5	...
868,837	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	130—135	...	...
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	106—110	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	113—118	−3	...
121,275	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	102—107	...	...
350,000	,,	Feb. 4	5½	5½	Swansea 5½ p.c. Red. Pref. ...	113—118	...	...
200,000	,,	Dec. 17	6½	6½	Do. 6½ p.c. Red. Deb. ...	100—105	...	...
1,076,490	,,	Feb. 18	6½	6½	Tottenham and District Ord.	150—155*	−5	150—157
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	131—136*	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125*	...	120
199,005	,,	Dec. 3	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	155—160	−5	...
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,326,700	,,	Feb. 4	7	7	Wandsworth Consolidated ...	157—162	−3	157—160
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	123—128	...	123½—125
1,317,964	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	128—133	−4	129½—133½
208,300	,,	,,	26/8	4	Do. 4 p.c. Deb. ...	104—109	−4	...
158,400	,,	Feb. 18	5	6g	Winchester W.& G. 5 p.c. Con.	116—121*	−2	...

Quotations at :—a.—Bristol. b.—Liverpool. c.—Nottingham. d.—Newcastle. e.—Sheffield. f.—The quotation is per £1 of stock. g.—Paid £3, including 10s. on account of back dividends. *Ex. div. †Paid free of income-tax. ‡For year.

COMPANY NOTICES.

THE EUROPEAN GAS COMPANY, LIMITED.

NOTICE is Hereby Given that the ANNUAL GENERAL MEETING of the Members will be held on Tuesday, the 19th day of March, 1935, at *Noon*, in the Essex Room, Great Eastern Hotel, Bishopsgate, London, E.C. 2, pursuant to the Regulations of the Company:

To receive the Report of the Directors and the Accounts of the Company for the year ended the 31st December, 1934;
To declare a Dividend;
To elect Directors and Auditors in the place of those retiring; and
To transact the Ordinary Business of such Meeting.

The Accounts to be submitted to the Members will be open for inspection at the Company's Offices on and after the 11th March.

The TRANSFER BOOKS WILL BE CLOSED from the 18th to the 29th March, both days inclusive.

In accordance with Clause 38 of the Company's Articles of Association, the Bearer of a Share Warrant may, on depositing his Warrant at the Registered Office of the Company, or at any Bank approved by the Directors, not less than forty-eight hours before the time of holding any Meeting, or adjourned Meeting, of the Company, with a statement in writing of his name and address, be present at such Meeting and vote thereat in respect of the shares included in such warrant.

By order of the Board,
T. H. MARTIN,
Secretary.

Montague House,
Devonshire Square,
London, E.C. 2,
March 8, 1935.

BRITISH GAS LIGHT COMPANY, LTD.

NOTICE is Hereby Given that the Two HUNDRED AND FOURTH ORDINARY GENERAL MEETING of the Company will be held at the Chief Office, 2, The Abbey Garden, Westminster, S.W. 1, on Wednesday, the 20th March, 1935, at 12.30 p.m. precisely, to receive the Report of the Directors and the Statement of Accounts for the Year ended 31st December, 1934; to confirm the payment of the Dividends on the Preference Stocks and to confirm the Interim Dividend and declare a Final Dividend on the Ordinary Stock; also to elect two Directors, to appoint two Auditors and fix their Remuneration, and to deal with any Business that may be legally transacted at an Ordinary General Meeting.

The TRANSFER BOOKS ARE CLOSED from the 6th to the 20th March, 1935.

By order of the Court of Directors,
A. J. MUMFORD, Secretary.

2, The Abbey Garden,
Westminster, S.W. 1,
March 11, 1935.

PATENTS.

THE Proprietor of British Patents Nos. 341,391, dated July 8, 1929, and 323,829, dated October 20, 1928, relating to "Improvements in Processes for Polymerizing Unsaturated Hydrocarbon Gases" and "Method and Apparatus for Producing Low-Temperature Coke" respectively, is desirous of entering into arrangements by way of a Licence or otherwise on reasonable terms for the purpose of exploiting the above Patents and ensuring their practical working in Great Britain.

Enquiries to B. SINGER, STEGER BUILDING, CHICAGO, ILLINOIS.

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Telegrams: "Patent, London." 'Phone: 0437 Holborn.
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